UNIVERSITY OF MINHO RESEARCH AND INNOVATION 2019



UNIVERSITY OF MINHO RESEARCH AND INNOVATION



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UNIVERSITY OF MINHO



MESSAGE FROM THE RECTOR

Research and innovation are two pillars that come together when universities are at stake. The expansion of the frontiers of human knowledge, in all areas and disciplines, is an irrefutable commitment of higher education institutions. Together with public and private entities, they are also committed to promoting knowledge transfer to society and the economy, in the form of new ideas, new products and new processes. Universities are supposed to transform ideas into value for society.

To achieve these goals, higher education institutions have to assure their human resources are highly qualified, that they have an adequate atmosphere, that research is of high quality, and finally that adequate interactions take place.

At UMinho we have a clear strategy to be an open and permanent space for knowledge production and furtherance of nationally and internationally relevant innovation across different social and economic sectors.

For many years, UMinho has adopted the principles of open access and open science. We aim at carrying out our scientific activity and the dissemination of the corresponding results transparently and



collaboratively; this implies that researchers, citizens, policymakers, state agencies, companies, and third sector organizations work in close cooperation facing research and innovation processes. We believe this is the shorter way to trigger smart and sustainable growth and qualified job creation.

At UMinho, we encourage the coupling between research and education. Our goal is to expand research opportunities and to give our students occasions to experience vibrant research environments, ensuring that learning goes beyond the "common" routines. Joining research and learning processes provides both undergraduate and postgraduate students with opportunities to own their learning process. We believe that research experience has a role to play in improving students' motivation for learning, in the pursuit of their interests.

Doing better science occurs when we make it both more sensitive to the needs of society and also more efficient in what concerns the allocated resources. It is also a question of accountability. This is fundamental for reinforcing society awareness about our contributions to human and social development. Following the 2018 publication, we present here the 2019 edition of *Research and Innovation*, a series that draws on the outcomes of the activity of the UMinho research and innovation ecosystem. This comprehensive volume gives particular emphasis to the Research Units outcomes, namely in terms of funding, research projects, papers, and the most important achievements; the activity of the Interface Units and Collaborative Laboratories in which UMinho participates is also reported, through their activities and institutional projects, making evident their importance for the continuous growth of our Institution, our region, and our country.

Rui Vieira de Castro Rector

THE UNIVERSITY OF MINHO

As stated in its strategic plan, the University of Minho (UMinho) sees itself in this context as an Institution that, based on its history and its present, projects itself as a comprehensive university, i.e., as a university that has a broad range of scientific and educational areas as its sphere of action, including social sciences and humanities, life and Earth sciences, health sciences, engineering and technology.

Furthermore, this plan reinforces the idea of an institution committed to research production and dissemination. It is clearly stated that we are a university that considers the production of scientific knowledge to be essential for the development of its mission, not only because this is the undeniable vocation of the university institution, but also because it is in new knowledge that education and interaction with society must be anchored. But if research based on quality parameters is essential to be competitive in modern society, the idea of a university in close interaction with society, and, in particular, the region that gave it the name, is always a major concern in every step of its development. It is assumed that we are building a university that, not calling into question what represents its historically constructed institutional identity, does not refuse to be open to its multiple surroundings, thus keeping an open dialogue with the economic, cultural and social actors, valuing, in the horizon of its action, the need to respond to the challenges that it faces.

Finally, there is a well-established idea to an internationalized university, i.e., a university that, without refusing its part in a specific regional and national context, assumes that the development of its



action, and particularly its research ecosystem, in an international context is inherent to the fulfilment of its mission, facilitating a close articulation of its projects with major reference institutions. The challenge placed to the University research ecosystem is that of defining strategies, providing practices and identifying instruments that allow developing this idea of Research University in the Portuguese, European and global contexts over this decade. This is why, and for what it represents as a condition of reflection on the present and future positioning intended for the University, that the development of the idea of University focused on high-quality research that is undertaken, and that it is intended to be pursued, gains actual meaning.



GUIMARÃES Couros Campus



GUIMARÃES Azurém Campus

UMINHO AS AN AGENT TO CREATE, SPREAD AND APPLY KNOWLEDGE

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UNIVERSITY OF MINHO uminho.pt



Institute of Arts and Humanities ilch.uminho.pt



Institute of Education ie.uminho.pt



Institute of Social Sciences ics.uminho.pt



Research Institute on Biomaterials, Biodegradables and Biomimetics i3bs.uminho.pt



School of Architecture arquitetura.uminho.pt



School of Economics and Management eeq.uminho.pt



School of Engineering eng.uminho.pt



School of Law direito.uminho.pt



School of Medicine med.uminho.pt



School of Nursing ese.uminho.pt



School of Psychology psi.uminho.pt



School of Sciences ecum.uminho.pt

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A RESEARCH UNIVERSITY

UMinho was founded in 1973 and welcomed the first students in the academic year of 1975/76. Throughout this yet short history, the University has offered access to a wide range of academic opportunities and scientific breakthrough. Pursuing the excellence of its faculty members and its scientific research, UMinho has been strengthening its central role in the regional development and its importance for the country and the world, being recognized as partner in the European and global scene with growing importance. As stated in its mission:

"The University's mission is to create, spread and apply knowledge, with free thinking and pluralism as its core values. Our goals are to promote higher education and to contribute to shaping a model of society based on humanistic principles, in which knowledge, creativity and innovation contribute towards growth, sustainable development, well-being and solidarity"

UMinho is more than ever committed to developing new opportunities for its students and working with the stakeholders to expand the teaching and research in areas where it's needed. It is the University's believe that the enhancement of its national and international reputation needs a strong focus on academic leadership and the development of a culture of high performance. UMinho encourages bold, independent thinking and is committed to improve the quality of academic experience to stretch and challenge both students and researchers. That starts at home so its relationship with the region is crucial to its success.

Believing that the future of education and research lies in the Institutions ability to become more flexible, the University's organizational structure is flexible and conducive to innovation and interdisciplinary research on emerging topics. With very different sizes and focus, but aligned by the same standards of excellence, UMinho is composed of 12 Schools and Institutes.

UMINHO RESEARCH UNITS RANKING AND ORGANIZATION

UMinho has currently 32 Research Units belonging to its 12 Organic Units (Schools and Institutes). In the 2019 international Research Unit evaluation programme, conducted by the National Science Foundation (FCT - Fundação para a Ciência e a Tecnologia) for the period 2020-2023 (Table 1), eight of its thirty-two research units (25%) that were submitted to evaluation received the highest score (excellent). Twenty others (~63%) got the second highest mark (very good). This means almost 90% of UMinho's research centers are ranked as excellent or very good. Four of the other research units were ranked as good.

Orga	nic Unit	Research Unit	Acronym	FCT Evaluation
	Institute of Arts and Humanities	Centre for Humanities	CEHUM	Very Good
	institute of Arts and Humanities	Centre for Ethics, Politics and Society	CEPS	Very Good
	Institute of Education	Research Centre on Education	CIEd	Very Good
		Research Centre on Child Studies	CIEC	Very Good
		Communication and Society Research Centre	CECS	Excellent
		Centre of Studies in Geography and Spatial Planning	CEGOT	Very Good
	Institute of Social Sciences	Interdisciplinary Centre of Social Sciences	CICS.NOVA.UMinho	Good
		Centre for Research in Anthropology Portugal	CRIA	Very Good
		Landscapes, Heritage and Territory Laboratory	Lab2PT*	Excellent
	Research Institute on Biomaterials, Biodegradables and Biomimetics	3B's Research Group	3B's**	Very Good
	School of Architecture	Landscapes, Heritage and Territory Laboratory	Lab2PT*	Excellent
		Research Centre in Political Science	CICP	Excellent
	School of Economics and Management	Centre for Research in Economics and Management	NIPE	Very Good
		Mechanical Engineering and Resource Sustainability Centre	MEtRICs	Very Good
		ALGORITMI Centre	CALG/ALGORITMI	Very Good
		Centre for Textile Science and Technology	2C2T	Very Good
		Centre of Biological Engineering	CEB	Excellent
	School of Engineering	Centre for Territory, Environment and Construction	CTAC	Good
		Institute for Polymers and Composites	IPC	Very Good
		Institute for Sustainability and Innovation in Structural Engineering	ISISE	Excellent
		High-Assurance Software Laboratory	HASLab	Very Good
		Centre for Microelectromechanical Systems	CMEMS	Excellent
	School of Law	Research Centre for Justice and Governance	JusGov	Very Good
	School of Medicine	Life and Health Sciences Research Institute	ICVS**	Very Good
	School of Nursing	Health Sciences Research Unit: Nursing - Nucleus UMinho**	UICISA:E NUMinho	Very Good
	School of Psychology	Psychology Research Centre	CIPsi	Excellent
		Centre of Plant Functional Biology	CBFP	Good
		Centre of Molecular and Environmental Biology	CBMA	Very Good
		Centre of Earth Sciences	ССТ	Very Good
	School of Sciences	Centre of Physics	CFUM	Very Good
		Centre of Mathematics	CMAT	Very Good
		Centre of Chemistry	CQ-UM	Good
		Laboratory for Instrumentation and Experimental Particle Physics	LIP	Excellent

*Shared by the two Organic Units **Evaluated as a single Unit (Associated Laboratory).

These results demonstrate UMinho as a recognized higher education institution as far as its commitment to research is concerned. Research is a structuring axis of UMinho's activity, meaning that over 95% of UMinho's researchers work in Research Units ranked as Excellent or Very Good within diverse fields such as Exact Sciences, Natural Sciences, Engineering and Technology Sciences, Social Sciences and Arts and Humanities.

The figure shows the current organization of the 32 Research Units within the 12 Organic Units.





and Biomimetics





RESEARCH CENTRE FOR JUSTICE AND GOVERNANCE

UMINHO PRIZE FOR SCIENTIFIC MERIT

UMinho recognizes annually the merit of a Professor/Researcher who has distinguished him(her)self for his(hers) research activity, through a prize awarded on the occasion of the anniversary ceremony. This is A Prize that is aimed to reward scientists with an intense career, recognizes the global action of a Researcher, which has contributed decisively to the University's name aggrandizement. A Researcher with a vision that may encourage others to sick for their best and to continue aspiring excellency in their research field.

One could argue that the need for recognition is just as strong as belonging, but there is a strong belief right from the begging that they complement each other. The excellence in Research at UMinho is, first of all, an example for young researchers, but also a recognition of the University to the effort, dedication and scientific value of its Researchers.

Since the first laureate in 2009, Nuno Peres from the School of Sciences, the list of winners includes Researchers from several schools, to whom UMIinho recognized excellence in their scientific careers. **2009** Nuno Peres (School of Sciences)

2010 Rui L. Reis (School of Engineering at the time, nowadays the I3Bs Institute)

2011 Carlos Mendes de Sousa (Institute of Arts and Humanities)

2012 Odd Rune Straume (School of Economics and Management)

2013 Nuno Sousa (School of Medicine)

2014 Armando Machado (School of Psychology)

2015 José António Teixeira (School of Engineering)

2016 Moisés de Lemos Martins (Institute of Social Sciences)

2017 Paulo Lourenço (School of Engineering)

2018 José González Méijome (School of Sciences)

In 2019, Full Professor Leandro da Silva Almeida, from the Education Institute, was awarded the University's Scientific Merit Award. The distinction was given to him during the ceremony to commemorate the 45 years of UMinho.

It is not only UMinho that leaves a mark on people... There are also people who leave their mark at UMinho and Professor Leandro Almeida is one of them.

LEANDRO DA SILVA ALMEIDA

Born in 1954 (Gondomar). Graduated in Psychology from the University of Porto (1980). After internships at Yale University (USA) and at the Catholic University of "Louvain-la-Neuve" (Belgium), he received his doctorate in Psychology at the University of Porto (1987). He joined the University of Minho in 1989, becoming a full professor in 1995, assuming functions of vice-rector and other academic positions. He teaches subjects in the fields of cognition, learning and research methodology. He supervised six dozen doctoral theses, being the author or co-author of more than four hundred publications, including books, chapters and articles. He is also co-author of some manuals and tests for psychological assessment in the areas of intelligence and learning used in Portugal and other Portuguese and Spanish speaking countries.

Over the years, he has been a principal researcher and co-principal researcher in research projects founding by the Foundation for Science and Technology - FCT, Gulbenkian Foundation, Erasmus+ Projects and Agency for Assessment and Accreditation of Higher Education (A3ES). In the last years, he has developed studies on the adaptation and success of students in higher education, coordinating until 2019 the ObservatoriUM - Observatory of Academic Trajectories of students of UMinho. He is on the editorial board of several scientific journals and is a member of several national and international scientific associations. He chairs the Council of Psychology of Education of Professional association of Portuguese Psychologists (Ordem dos Psicólogos Portugueses). He was a member of the scientific council of the Institute of Educational Innovation (Ministry of Education) and was a member of the National Council of Education.

Not everything that shines is gold!

There is no doubt: some research and scientific papers are scarce in their relevance. When a validity criterion is set, a selection is usually introduced. How many vaccines for COVID-19 would we already have on the market if a validity criterion was not set! In Social and Human Sciences (SHS), in which I enrol, it is up to the researchers and "consumers" themselves to assume some critical thinking and set the benchmark for the analysis and assumption of what has been delivered and spread. In this or any other area, we must keep alert for all sort of agendas.



High-quality research in SHS, as in other areas, requires researcher competence, resources, and ethics. At the same time, the quality of the research benefits from multidisciplinary teams covering diverse theoretical and methodological approaches, even more so when such teams represent international centres and networks. The quality of the research and outputs are highly strengthened by respecting science nature itself. Science does not exist if it is not shared. Science does not exist without considering previous theories. If we have seen further, it is by standing on the shoulders of giants. If science holds the promise of a better future is because science is a collaborative effort.

Research in SHS has its particularities, which we do not want to assume here as strengths or weaknesses. All research is demanding. SHS has its challenges. Some critical points can guide researchers to guarantee the quality of their research in all its stages, including the dissemination of results, and can also guide the research community and the public to ensure a critical evaluation of the results and conclusions.

The results, and the conclusions derived from them, are strongly associated with the conditions under which the research takes place, with the procedures for collecting and analyzing the data, and with the researcher's decisions at different levels. The intention that moves the researcher and the values he chooses to follow in each decision-making, alone, would not fit in this short space of reflection due to its relevance. In a necessarily brief way, some of these conditions and procedures that may question the accuracy and validity of the information, certainly more contextualized in SHS, are listed below.

Firstly, it is important to define the problem and clarify the phenomena under investigation. Sufficient effort is not always devoted to delimiting and clarifying the phenomenon under study and, worse, to mastering the literature available in this area. In this regard, the inaccuracies are decisive, namely, to compare the collected data with the state of art before concluding. This is crucial as it determines the nature of the research aim and the methodological procedures to be followed. Are we facing an investigation that aims to describe a phenomenon in its occurrence, to identify variables or circumstances of its manifestation, or, even more demanding, are we facing an investigation that aims to explain a phenomenon in its determinants to the point of being able to replicate it? Let us recognize that the latter aim is particularly difficult in SHS. The stages of the investigation and their inherent methodological options are pivotal for the validity of the study, its data and conclusions. Inaccurate questions or hypotheses make it difficult to analyze the data obtained in response to the same questions or to accept or reject the hypotheses. Particularly relevant to this reflection are four methodological aspects of every investigation: sample, data collection, ethics, and data processing.

The quality of the sample stems from those who define and follow sample collection procedures, not from the number of sample participants. As in SHS the sufficiency (size) and representativeness (quality) of the sample is not always addressed sometimes it is very difficult or even impossible – the alternative is often convenience sampling. If rigour should be the best friend of any researcher, in SHS the accuracy of whoever reports data (in addition to who reads it), more than a key element, is a prerequisite.

The quality of data collection stems from the selection of measures and techniques not from participants themselves. As in SHS, the use of questionnaires, inventories, or self-report scales is massive, the use of objective measures is highly recommended.

The quality of data stems from the ethical principles (anonymity, consent, approval, withdrawal) and the contexts and circumstances ensured for data collection, not from participants themselves. Constrained people do not guarantee reliable information; interviewing people at home or in their workplace; or collecting student data in the classroom or bars, can introduce bias.

The quality of the data processing and the knowledge derived from it depends on the researcher's intentionality and proficiency in the analysis techniques. The illusion that software or programs increase the objectivity of the results is frequent. The researcher must be more proficient than the techniques he uses; otherwise, he becomes his "slave".

In the end, conclusions are not always legitimized by data and, even when they are, they do not always meet the standards for scientific communication. Editorial policies and the publish or perish culture are strong obstacles to the greater seriousness and free disclosure of the "discoveries"! To fulfil its purpose, science requires the researcher to be able to accept the complexity of phenomena, tolerate the ambiguity and volatility of science itself, and be intellectually humble. Only then will the researcher be available to accept listening and considering ideas different from his own!

RESEARCH

CENTRES

UMINHO RESEARCH FUNDING

A strong indicator of the research quality in UMinho is the sucess in achieving projects with relatively high budgets, including ERC grants. UMinho is actually amongst the universities with the highest success rate in Portugal in attracting European funding. In Horizon 2020 programme, UMinho has been particularly competitive in the fields of research involving companies and enterprises in diverse fields including nanotechnologies, (bio)materials and new production technologies, IT and communication technologies, food, agriculture, fishing and biotechnology.

It is also worth noticing the fact that UMinho takes part in all the international partnerships promoted by the Portuguese Government, namely the MIT- Portugal (Massachusetts Institute of Technology), the CMU-Portugal (Carnegie Mellon University), the UT Austin-Portugal (the University of Texas at Austin) and the Harvard-Portugal (Harvard University) Programmes.

In terms of research projects and despite the absence of FCT calls, the year 2019 was very positive. Ninety-two new projects were approved, corresponding to a total budget of about thirty-seven million euro. These values compare quite well with the forty-three million euro obtained in 2018, which corresponded to a total amount of 257 new projects obtained (but with a national FCT call for new projects in every scientific area). Fourteen of the ninety-two new projects obtained in 2019 were European projects (15.2%), with a total budget of about 5.4 million euro (14.6% of the total budget obtained). Sixteen other projects (17.4%) were obtained in several other international calls, corresponding to an accumulated budget of more than 1.5 million euro (4.1% of total budget). In terms of national funding, forty-six new projects (50%) were obtained within the PT 2020 funding programme, corresponding to more than 79% of the total funding obtained in 2019 (37.3 million euro). Lastly, sixteen other projects (17.4%) were obtained in other national competitive calls, corresponding to a total budget of about 0.8 million euro (about 2.1% of the total obtained budget).

Table 2 shows the distribution of the 92 new projects obtained in 2019 between the different Organic Units of UMinho (including the 5 projects obtained by the UMinho central services).

Taking into account these new projects and those running during 2019 (obtained before 2019), Table 3 shows the total funding of

research projects (global funding for the entire duration of the projects) within the different Organic Units of UMinho (including the projects obtained by the central services).

For the summary presented in both tables, projects that are shared between different Research Units are counted as one (for the PI Research Unit) and the budget appears divided between the different Research Units.

Beyond this funding, it also to note the global funding obtained by the 32 different Research Units of UMinho, as a result of the publication of the 2017/2018 international Research Unit evaluation programme, conducted by FCT at the end of the year of 2019. Table 4 shows a summary of the overall funding of the different Research Units. To note that the funding presented for the Research Units that UMinho is a pole (7 shaded cells) is the total value for the all multi-pole Unit and not only for the UMinho one (the name of the Research Unit presented is that of the UMinho pole).

Table 2 New research projects obtained during 2019 and their total funding for the different Organic Units of UMinho.

	E	uropean	Int	International National PT2020			Other National			Total
Organic Unit	N.°	Funding	N.º	Funding	N.º	Funding	N.º	Funding	N.º	Funding
Institute of Arts and Humanities	-	-	-	-	1	48.555€	-	-	1	48.555€
Institute of Education	-	-	-	-	-	-	1	800€	1	800€
Institute of Social Sciences	-	-	1	9.000€	-	-	-	-	1	9.000€
Institute of Social Sciences/ School of Architecture (Lab2PT)	-	-	-	-	-	-	1	1.000€	1	1.000€
Research Institute on Biomaterials, Biodegradables and Biomimetics	3	530.000€	2	423.681 €	3	451.986€	-	-	8	1.405.667€
School of Economics and Management	-	-	-	-	1	72.184€	1	124.831€	2	197.015 €
School of Engineering	5	3.937.338 €	2	160.000€	30	26.418.025 €	6	366.088€	43	30.881.451 €
School of Law	-	-	-	-	-	-	-	-	-	-
School of Medicine	1	319.625 €	8	920.111 €	-	-	3	145.396€	12	1.385.132€
School of Nursing	-	-	-	-	-	-	1	29.910€	1	29.910€
School of Psychology	-	-	-	-	-	-	1	25.000€	1	25.000€
School of Sciences	4	549.200 €	3	6.000€	7	1.533.047€	2	90.551€	16	2.178.798 €
Central Services	1	108.500€	-	-	4	1.004.093 €	-	-	5	1.112.593€
Total	14	5.444.663€	16	1.518.792 €	46	29.527.891	16	783.576 €	92	37.274.922€

Table 3 The total amount of research projects running in 2019 (including new ones obtained in 2019 and finished during the year) and their global funding.

 National

at	at fanding.		European		International		National Oth PT2020		Other National		Total
	Organic Unit	N.º	Funding	N.º	Funding	N.º	Funding	N.º	Funding	N.º	Funding
	Institute of Arts and Humanities	-	-	-	-	1	48.555€	3	626.972€	4	675.528€
	Institute of Education	2	119.411 €	1	17.728€	4	521.012€	7	495.029€	14	1.153.180€
	Institute of Social Sciences	2	1.504.048 €	2	124.999€	7	1.644.253€	1	26.142 €	12	3.299.441 €€
	Institute of Social Sciences/ School of Architecture (Lab2PT)	-	-	1	84.190€	2	494.829€	6	251.605 €	9	830.624€
	Research Institute on Biomaterials, Biodegradables and Biomimetics	17	17.518.151€	9	1.241.262 €	41	24.161.833€	12	1.938.298 €	79	44.859.543 €
	School of Economics and Management	-	-	-	-	5	490.078 €	7	668.903€	12	1.158.981 €
	School of Engineering	25	10.327.902 €	20	1.652.665 €	207	67.935.755 €	34	2.218.004 €	286	82.134.326€
	School of Law	1	46.518 €€	1	169.222 €	-	-	1	220.201€	3	435.941€
	School of Medicine	3	597.981 €	25	3.001.501 €	41	13.432.300€	18	1.175.872 €	87	18.207.653€
	School of Nursing	-	-	-	-	2	171.058 €	1	29.910€	3	200.968 €
	School of Psychology	1	23.204 €	-	-	16	2.827.476 €	5	191.000€	22	3.041.681€
	School of Sciences	8	1.424.674€	12	744.695 €	81	11.920.898 €	17	1.392.117 €€	118	15.482.384€
	Central Services	7	1.224.204€	-	-	5	1.461.207€	1	213.489€	13	2.898.901€
	Total	66	32.786.094€	71	7.036.262€	412	125.109.254€	113	9.447.542€	662	174.379.152 €

Table 4 The overall funding of the different Research Units as a result of the FCT evaluation programme.

Organic Unit	Research Unit	PhD	Rank	Base	Progra	ammatic Su	pport*	Total	Special
		inegrated Researchers		Funding*	Scholarships	Contratcs	Funding	Funding*	Funding**
Institute of Arts and	Centre for Humanities	40	Very Good	565.500	4	1	345.000€	910.500€	-
Humanities	Centre for Ethics, Politics and Society	14	Very Good	180.000	5	2	570.000€	750.000€	-
Institute of Education	Research Centre on Education	38	Very Good	562.500	4	1	247.000 €	809.500€	-
Institute of Education	Research Centre on Child Studies	50	Very Good	705.000	4	1	281.000€	986.000€	-
	Communication and Society Research Centre	68	Excellent	1.201.200	12	3	894.000 €	2.095.200€	-
Institute of Social	Centre for Research in Anthropology Portugal	76	Very Good	1.057.500	5	1	388.000€	1.445.500€	-
Sciences	Centre of Studies in Geography and Spatial Planning	65	Very Good	807.000	3	-	153.000€	960.000€	-
	Interdisciplinary Centre of Social Sciences	138	Good	1.612.000	4	1	288.000€	1 900.000 €	-
Institute of Social Sciences /School of Architecture	Landscapes, Heritage and Territory Laboratory	58	Excellent	1.001.000	6	3	820.000 €	1 821.000€	-
Research Institute on Biomaterials, Biodegra- dables and Biomimetics/ School of Medicine	3B's Research Group/Life and Health Sciences Research Institute	161	Very Good	2.205.000	10	3	970.000€	3.175.000€	128.025€
Cohool of Feanomica	Research Centre in Political Science	34	Excellent	566.020€	5	2	440.000 €	1.006.020€	-
School of Economics and Management	Centre for Research in Economics and Management	33	Very Good	495.000€	5	2	546.000 €	1.041.000€	-
	Centre for Textile Science and Technology	26	Very Good	390.000€	4	1	235.000€	625.000€	-
	ALGORITMI Centre	101	Very Good	1.492.500€	3	-	-	1.492.500 €	-
	Institute for Sustainability and Innovation in Structural Engineering	59	Excellent	1.011.920€	8	2	965.000€	1.976.920€	-
School of Engineering	Centre for Territory, Environment and Construction	27	Good	328.600€	2	1	250.000€	578.600€	-
	Mechanical Engineering and Resource Sustainability Centre	24	Very Good	352.500€	2	-	224.000€	576.500€	-
	Centre for Microelectromechanical Systems	29	Excellent	513.240€	3	1	285.000€	798.240 €	64.255€
	Centre of Biological Engineering	126	Excellent	2.251.340€	7	1	485.000€	2.736.340 €	297.954€
	Institute for Polymers and Composites	23	Very Good	337.500 €	6	1	385.000€	722.500€	-
	High-Assurance Software Laboratory	286	Very Good	4.290.000€	14	2	1.070.000€	5.360.000€	1.110.722 €
School of Law	Research Centre for Justice and Governance	58	Very Good	678.000€	5	1	347.000€	1.025.000€	-
School of Nursing	Health Sciences Research Unit: Nursing - Nucleus UMinho	131	Very Good	1.897.500€	7	2	683.000€	2.580.500€	-
School of Psychology	Psychology Research Centre	44	Excellent	800.800 €	6	2	605.000€	1.405.800€	236.005 €
	Centre of Mathematics	41	Very Good	615.000€	5	1	381.000€	996.000€	-
	Centre of Chemistry	27	Good	334.800€	1	-	85.000€	419.800€	-
	Centre of Molecular and Environmental Biology	48	Very Good	685.500€	6	1	225.000€	910.500€	-
School of Sciences	Centre of Physics	86	Very Good	1.275.000€	8	2	647.000 €	1.922.000€	-
	Laboratory for Instrumentation and Experimental Particle Physics	85	Excellent	1.547.000€	8	2	722.000€	2.269.000€	823.141€
	Centre of Plant Functional Biology	131	Good	1.567.360€	8	1	435.000€	2.002.360€	-
	Centre of Earth Sciences	76	Very Good	1.065.000€	9	2	742.000€	1.807.000€	-

UMINHO RESEARCH PUBLICATIONS

UMinho publications record is also worth mentioning. Table 5 summarizes all SCOPUS indexed publication items by UMinho researchers. The record demonstrates that there has been a clear and systematic increase in recent years, being the total amount of documents published in 2019 almost tripled that of 2009.

The most important international rankings that emphasize scientific research performance do recognize the relevant impact of UMinho in this particular respect. In the Academic Ranking of World Universities (Shanghai Ranking), UMinho was placed in the range #401-500. Furthermore, UMinho has been ranked in the TOP 500 universities worldwide for the last 4 years and it is the 3rd best Portuguese University in the Shanghai Ranking. UMinho is one of the Portuguese institutions with the highest number of Highly Cited Researchers (3) in the 2019 edition from the Web of Science Group (Clarivate Analytics).

ltem	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Article	720	836	960	1199	1330	1418	1554	1620	1550	1683	1814
Conference paper	367	443	480	558	618	585	614	574	621	594	735
Book Chapter	38	39	68	107	139	105	129	208	141	134	125
Review	37	40	61	78	69	84	103	118	127	152	170
Editorial	15	17	32	35	30	42	42	57	68	59	64
Note	4	5	6	6	8	6	15	11	8	16	12
Book	3	3	9	12	14	13	15	22	17	6	8
Erratum	3	10	1	3	5	8	15	9	15	7	14
Short Survey	3	1	3	5	2	4	8	9		6	4
Letter	1	5	8	11	6	5	11	8	7	17	11
Retracted						1	1				
Data Paper								1		2	1
Undefined								1	10	43	2
Total	1191	1399	1628	2014	2221	2271	2507	2638	2564	2719	2960

Table 5 SCOPUS indexed publications for UMinho from 2009 till 2019.

CENTRE FOR HUMANITIES

The Centre for Humanities (Centro de Estudos Humanísticos/CEHUM) is the oldest Research Unit of the Institute of Arts and Humanities of UMinho. It was founded in 1994 as a follow-up Research Unit to the former Centre for Portuguese Studies (CEP), founded in 1980 with a central focus on Literary Theory and Portuguese Literature and Linguistics. Currently, CEHUM integrates research in the fields of Literature, Linguistics, Culture, Arts (Music and Theatre) and Philosophy, the main domains of expertise of the Institute of Arts and Humanities. CEHUM's members develop their research activities within 11 consistent mono- and multidisciplinary research teams, with the aim of developing fundamental and competitive activities with international impact on diverse fields of the Humanities. Important vectors of research include studies on migrations and marginalization, on gender and arts, post-colonial studies, and studies on identity (hu-

man, animal, machine) combined with intermediality and interart poetics. As a kind of backbone, these multidisciplinary teams guarantee the cohesion of CEHUM in its diversity, fostering the dynamics between researchers in different domains. The multidisciplinary approach coexists with monodisciplinary research focused on theoretical and experimental linguistics and on Portuguese and Lusophone Literature. Emerging areas within the Centre, with impacting new work, are Digital Humanities, Asian studies and Performance studies, which combines sustained artistic practice with academic research. Besides the ca. 55 senior researchers, CEHUM includes a significant number of junior researchers, having expanded the number of young researchers with PhD or post-doc fellowships, who contribute to the research dynamics of the Centre. A large number of external collaborators from other national and international institutions



cooperate with CEHUM's teams. Also, most of CEHUM's senior researchers participate actively in international networks or projects. Due to these dynamics, this Research Unit is in the forefront of developing fundamental, multidisciplinary work in the area of the Humanities, recognized both nationally and internationally. CEHUM was evaluated as Very Good in FCT's 2019 evaluation process.

CEHUM hosts three peer-reviewed journals (Diacrítica, Revista 2i, H2D – journal on digital humanities), and publishes two monograph series (Hespérides and Poliedro collections), as well as a large number of proceedings (e.g., the Autumn Colloquia) and anthologies of theoretical texts in Portuguese. These publications have enlarged the dynamics of the Centre as well as its national and international visibility. CEHUM shares (with the Centre for Ethics, Politics and Society) a specialized and constantly updated library on Human Sciences (Biblioteca Vítor Aguiar e Silva), which includes a special section of rare books.

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🕴 Staff





Total members

172

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	1	3	3	2	-	9
Indexed proceedings -			Book chapters	International 2	National -	Total 2
Number of citations	59					
Publications with international collabo	Publications with international collaboration				Editor	Guest Editor
Publications in top 10% prominence pe	rcentile	18%		Journals or collections	-	3
			SCOPUS		Cla	rivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	0,6		0,4	0,7		0,5

2. Books

Туре	International	National	Total
Authoring	4	8	12
Edition	-	5	5
Book of proceedings	1	4	5
Outreach book	-	-	-
Non-indexed book chapters	37	33	70
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	77 17		Journals or collections		Editor 5	(Guest editor -	
UMinho Repositorium	Open c	access documents 79		Total downloads 56.531			Others	32
Communications	<i>Internati</i> Oral	onal Poster	Oral	National Poster				
	91	-	123	-				

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	430.943 €	90.063 €
	Others	1	48.555€	-
	Total	3	479.498 €	90.063 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	II (National + International)	3	479.498€	90.063€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	36		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International -	National -	Total

Theses and Dissertations

Theses and dissertations	
PhD theses completed	1
On-going PhD theses	39
Master dissertations completed	50

Major achievements

Flagship publications

Conversar-escrevendo: João Cabral e Murilo Mendes Colóquio/Letras (2019) 200. 123-160.

O trabalho com as pedras. Da leveza, do poético e do autorretrato na escrita de António Lobo Antunesy

Colóquio-Letras (2019) 201. 54-69.

As narrativas de Mona Hatoum e o efeito de 'contraponto': des-emoldurando o doméstico enquanto performatividade e gesto político Revista de Estudos Feministas (2019) 27 (1). e58888.

Pro as a minimal nP: Toward a unified approach to pro-drop

Linguistic Inquiry (2019) 50 (3). 487-526.

The Use of Theatre of the Oppressed in the Classroom: Engaging Students in a Critical Active European Citizenship Project

The Educational Forum (2019) 83 (4). 365-382.

Flagship projects



Eurregion Smart Tourist Destination

Coordinated by Agencia para la Modernización Tecnológica de Galicia, and in collaboration with Portuguese and Spanish institutions [project funded by INTERREG VA España - Portugal Program (POCTEP) 2014-2020]. UMinho PI: S. Araújo.

REESCREVER O SÉCULO XVI Projeto multidisciplinar: Literatura portuguesa.

Literatura brasileira, História literária, História cultural.

Rewriting the 16th Century

This multidisciplinary project on Portuguese and Brazilian Literature, Literary and Cultural history is a joint initiative of the Universidade de São Paulo/Brazil and the Universidade do Minho, through the PLP research team. (Edital AUCANI 1024 USP-UMinho 2019-2022). UMinho Pl.: M. Ramon



Letters to Miguel Torga

This project refers to the transcription and analysis of Torga's correspondence, found in his archive. The result is a publication of a representative selection, accompanied by an introductory study and explanatory notes. PI: C.M. de Sousa

Scientific recognition

Ramón Essay Prize 2019

Xaquin Sabarís Nunez won the "Premio Ramón de Ensaio 2019" (by the Secretaría Xeral de Política Lingüística da Xunta de Galicia and Editorial Galaxia), with his work Cartografías da Narrativa Galega Contemporânea.



Scientific leadership



Eça de Queirós Foundation (FEQ)

Orlando Grossegesse board member of the Fundação Eça de Queiroz (FEQ) and steering committee of its Cultural Council. He also coordinates the CET-Tormes (Translation Study Center, associated with FEQ), since its foundation in 2016.



SuonArt - Cultural Association

Elisa Lessa is President of SuonArt - Associação Cultural, whose aim is the promotion, dissemination, training, exercise and creation of Music, by developing activities in the fields of musical programming and artistic training.



European Association of Chinese Language Teaching)

Sun Lam is the General Secretary of the European Association of Chinese Language Teaching, an international organization of national associations, institutions and individuals from all over Europe, which have the common objective not only of promoting and improving the teaching and learning of Chinese as a second language, but also of providing research on the topic. More information: http://www.ouhanhui.eu/?page_id=1791

CENTRE FOR ETHICS, POLITICS AND SOCIETY

The Centre for Ethics, Politics and Society (CEPS) is a Research Unit of the Institute of Arts and Humanities at UMinho, created on March 27, 2017. CEPS is the only research Centre in Portugal specializing in the areas of Political Theory and Applied Ethics and it includes 17 integrated members. CEPS's distinctive ethical-political perspective is focused on social institutions rather than individual behaviours. CEPS's researchers are particularly interested in studying and evaluating specific types of institutions and practices in the contemporary world from the ethical-political perspective: those of constitutional democracy, those of social justice and those of technological intervention and their relation with the quality of life of populations. The study of these practices is carried out, respectively, within the framework of theories of political legitimacy, normative conceptions of social justice, and ethics applied to technology and populations, with a special concern regarding the historical reconstruction of all these theoretical frameworks.

The mission of the Centre is to provide high quality research, knowledge, training and consulting in the fields of political philosophy and applied ethics. The main aims of the Centre for the 2018-2022 period are: to consolidate its role as an academic reference point by raising its research output and dissemination to the international benchmark; to continue developing the two fields of Political Philosophy and Applied Ethics in close articulation. CEPS intends to attain such goals through the development of the projects we have already launched, the reinforcement of cooperation with external institutions by co-promoting R&D projects and establishing new partnerships, the strengthening of its international profile, namely via the publishing of the Ethics, Politics & Society journal, the



training of students and future researchers in Political Philosophy and Applied Ethics within the Masters in Political Philosophy, and the organisation of outreach activities as follow-up of our research in order to increase its impact on the community.

In the external evalution provided by FCT in 2019 CEPS was graded "Very Good" and became the Centre with the highest per capita funding in the University of Minho. **Director** João Manuel Cardoso Rosas

Vice-director Alexandra Abranches

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Total members

31

🕴 Staff




Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	4	4	1	-	-	9
Indexed proceedings -						
Number of citations	8					
Publications with international collab	oration	0%			Editor	Guest Editor
Publications in top 10% prominence p	percentile	0%		Journals or collections	1	1
l			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	1,1		0,4	0,8		0,6

2. Books

Туре	International	National	Total
Authoring	-	1	1
Edition	-	-	-
Book of proceedings	1	-	1
Outreach book	-	-	-
Non-indexed book chapters	6	-	6
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	10 2		Journ	als or collections	Editor 1	Guest editor 2	
UMinho Repositorium	Open ac	ccess documents 16		Total downloads 7.630		Others	7
Communications	Internatio Oral 34	nal Poster -	Oral 3	National Poster -			

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	1	196.029€	24.727€
	Others	-	-	-
	Total	1	196.029€	24.727€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	al (National + International)	1	196.029€	24.727€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	9		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	3	3

Theses and Dissertations

There and discontations

Theses and dissertations			
PhD theses completed	4		
		In cooperation with international institutions	2
On-going PhD theses	13		
		In cooperation with international institutions	2
Master dissertations completed	2		

Major achievements

Flagship publications

Rendimento Básico Incondicional: Uma Defesa da Liberdade (2019).

Ethics, Politics & Society A Journal in Moral and Political Philosophy (2019) 2.

Environmental and Animal Defense American Behavioral Scientist (2019) 63 (8).

On the Importance of Species for Rule-Consequentialism Utilitas (2019) 31 (2).

Representing Judgment - Judging Representation: Rhetoric, Judgment, and Ethos in Democratic Representation

Contemporary Political Theory (2019) 18 (4). 519-540.

Flagship projects



UBIEXP - Basic Income Experiments

UBIEXP - The political philosophy and epistemology of basic income experiments: a critical examination is a project coordinated by Roberto Merrill and funded by FCT.



Intellectual Debates on Democracy and Civic Rights

CA 16211 - Reappraising Intellectual Debates on Democracy and Civic Rights in Europe (coord. José Maria Rosales, U. Málaga) is a Cost Action. João Cardoso Rosas is a member of the team and representative of Portugal in the Managment Commitee.



Climate Chenge, Denialism and Advocacy

THINKCLIMA - Climate change, denialism and advocacy communication. Discourse and strategies of think tanks in Europe (coord. Núria Almirón, U. Pompeu Fabra). Cátia Faria is the representaive of CEPS in this project based in Barcelona.

Scientific recognition

Social Analysis Essay Prize

António Baptista: Análise Social Essay Prize for the best article published in the preceding year (title of the article: "A Liberdade em Polanyi").



Res Publica Essay Prize

Roberto Merrill: Res Publica Essay Prize (2nd. place) for the paper "Rendimento Básico: uma Ferramenta para uma Europa Social?".



Sapientia Prize

Acílio Estanqueiro Rocha: "Sapientia Prize" 2019 for prominence in European Thought, of the Sociedad Interuniversitária de Filosofia, U. Santiago de Compostela.



Scientific leadership



CEPS host the project UBIEXP and is a partner of the World Basic Income Congress

UBIEXP project (coord. Roberto Merrill): Partner of the World Congress on Basic Income, in 2019, which took place in Hyderabad, India.



CEPS researcher is elected to the Academy of Sciences Acílio Estanqueiro Rocha: Member of the Academy of Sciences (Lisbon).



CEPS researcher is president of the General Assembly of the Philosophical Society

João Cardoso Rosas: President of the General Assembly of the Portuquese Philosophical Society.

RESEARCH CENTRE ON EDUCATION

The Research Centre on Education (CIEd) is a multidisciplinary Research Unit of the Institute of Education, whose mission is to conduct educational research as a means of participating in the transformation of the lives of individuals and communities. Since 1976, research conducted at the Centre focuses on children, youth, adults, and elder, in a variety of social settings and types of communities, taking into consideration the diverse cultural and social constraints and resources that impact on learning, envisioning that all citizens are equally prepared to participate actively and critically in the society.

In order to achieve the CIEd main intent, to ensure better learnings for better futures, the research developed at this unit is guided by pivotal concerns such as: quality and internationalization, impact and outreach as well as the training of young researchers. The plurality and diversity of approaches to educational phenomena and the merging of traditional key areas with emergent educational topics in the study of school and non-school educational phenomena in a lifelong learning perspective, as well as the high number PhD students from different parts of the world, are distinctive aspects of the Centre, reflected in an increasing scientific production, at national and international levels. In the 2019 evaluation carried out by the National Science Foundation (FCT), the Centre was awarded with the grade of Very Good.

Four Research Groups implement the research Centre policy, mission and goals according to their main areas of knowledge, through medium and long-term objectives that guide the organisation and development of own and joint research projects: Education Policies, Governance and Management: Education 3D-Democracy, Inequality



and Difference; Psychosocial Development, Learning and Special Needs; Science Education for Sustainable Development; Technology, Multiliteracies and Curriculum.

The mission of disseminating knowledge and more broadly interacting with the academic and social communities is also ensured by the edition of the 30-year-old Portuguese Journal of Education (RPE), a Scopus indexed peer reviewed online journal with wide national and international recognition.

Several projects, funded by national and international agencies are being developed in the context of CIEd, a Research Unit that is working towards an increasing international recognition for the quality of its research and training of young researchers.

637

Director Leonor Maria Lima Torres

Vice-director José António Brandão de Carvalho

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Total members

🛉 Staff





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	10	8	16	8	-	42
Indexed proceedings 5						
Number of citations	401					
Publications with international collab	oration	24%			Editor	Guest Editor
Publications in top 10% prominence percentile		11%		Journals or collections	8	-
l			SCOPUS		Cl	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	1,5		0,5	0,9		0,9

2. Books

Туре	International	National	Total
Authoring	2	4	6
Edition	5	9	14
Book of proceedings	3	4	7
Outreach book	-	-	-
Non-indexed book chapters	47	48	95
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	71 90		Journal	s or collections	Editor 26	Guest editor -	
UMinho Repositorium		s documents 36	T	otal downloads 187.314		Others	8
	International			itional			
Communications	Oral Po:	ster	Oral	Poster			
	123	5	111	17			

On-going research projects and funding for the Centre

	National Funding	<i>№</i> of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	214.370 €	48.124 €
	Others	5	259.934€	46.960 €
	Total	7	474.304 €	95.084 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	5	118.411€	48.542 €
	Others	-	-	-
	Total	5	118.411€	48.542 €
Tot	al (National + International)	12	592.715 €	143.626 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	-	-	-
International meetings organization	14		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	18	66	84

Theses and Dissertations

Theses and dissertations PhD theses completed	30
On-going PhD theses	154
Master dissertations completed	118

Major achievements

Flagship publications

Towards an effective use of language to explain light in the museum *Science Education* (2019) 103 (4). 923-946.

Differential effect of university entrance score on first-year students' academic performance in Portugal

Assessment & Evaluation in Higher Education (2019) 44 (4). 610-622.

Socio-emotional development in high functioning children with Autism Spectrum Disorders using a humanoid robot

Interaction Studies (2019) 20 (2). 205-233.

The distinction of excellent students in the Portuguese state school as a strategy of educational marketing accountability

Educational Assessment, Evaluation and Accountability (2019) 31 (2). 155–175.

Digital reading in the early years

The Routledge Handbook of Digital Literacies in Early Childhood (2019). 270–281.

Flagship projects



G2L&G2E – Games to Learn and Gamification to Engage

The project introduces Game Based Learning and Gamification as a scenario of pedagogical innovation that meets the needs of students and teachers, leading to an effective and more involving learning, through collaborative and reflexive practices.



RISE – Roma Inclusive School Experiences

Based on the action-research method, RISE's main goal is to promote a more welcoming and inclusive school for Roma children 6 to 14 years old and to fight their discrimination in education, through a strategy based both on changes in teaching methodologies and on the empowerment of Roma families.



SUnStAR – Supporting University Students At Risk of dropping out

This Erasmus+ project aims to build an online tool for supporting higher education students at risk of dropping out, providing them with basic and soft skills that can contribute both to their personal development, academic success and to lifelong learning.

Scientific recognition

Leandro Almeida - UMinho Scientific Merit Prize

Upon each anniversary, the University of Minho distinguishes one of its Professors/Researchers for their outstanding research activity and career.



Ana Paula Martins - "Best Presentation" at International Conference on Innovation, Documentation and Education (Espanha)

The paper entitled "Development of specific learning disabilities in Portugal: National & international challenges" By Ana Paula Loução Martins & Paula Marisa Fortunato Vaz was selected as one of the best papers to be presented in video format in the International Conference on Innovation, Documentation and Education that was held in Valencia, Spain.



Scientific leadership



Ana Maria Serrano - Member of the Coordinating Comitee of the International Society of Early Intervention (ISEI)

ISEI is a world organization in ECI, with a CC of 19 specialists in leadership positions, which provide an international overview of the diverse array of biomedical and behavioral ECI research and practice. ISEI's goal is to enhance the ability of ECI professionals throughout the world to work together to advance ECI concepts and practices.



José António Brandão de Carvalho - Board member of the European Association for the Teaching of Academic Writing (EATAW)

The European Association for the Teaching of Academic Writing (EATAW) is an international organisation that aims to connect teachers and researchers working in the area of academic writing, highlighting the role of writing across the university curriculum and promoting goodpractices.



Maria de Lourdes Dionísio - Co-coordinator of the Educational Sciences evaluation panel of the FCT Call for PhD Research Scholarships

The Call for PhD Studentships aims to support researchers, in all areas of knowledge, who wish to develop research activities leading to a PhD degree.

RESEARCH CENTRE ON CHILD STUDIES

The Research Centre on Child Studies (CIEC - "Centro de Investigação em Estudos da Criança") was created in 2011, as a result of merging two former Research Units devoted to Child Studies (CESC and CIF-PEC), both allocated to the Institute of Education of UMinho. Since both were dedicated to studies about children, although with slightly different approaches, it was decided to combine them to form a single R&D Unit, so increasing the Child Studies critical mass while retaining the same values, and also fostering synergies and cross-fertilisation among the groups from the former units.

CIEC-UM aims at undertaking research that contributes to improving children's well-being, development and learning, through a holistic approach that considers a wide range of social factors that impact children's development and education. Children are viewed in all civil, political, social, economic and cultural dimensions, where education and how they learn and develop their personal and social skills play a fundamental role. In the 2019 evaluation carried out by the National Science Foundation (FCT), CIEC-UM was awarded the grade of Very Good.

CIEC-UM is organised in 2 research groups: RG1 - Children's contexts, their everyday life and well-being; RG2 - Children's learning and development. Although the research focuses mainly on children, conceptions and practices of adult professionals working with children are also studied. These include educators, teachers, social service professionals, nurses and other health professionals, who have a key role in enhancing capacity building and in the dissemination of the results to stakeholders, i.e. those who can make use of the research outcomes to address their problems. With this in mind, CIEC-UM develops in 5 thematic strands: TS1 - Children's social practices and their contexts; TS2 - Child health, environment and physical education; TS3 - Childhood professionals; TS4 – Pedagogical



resources for children; TS5 - Cultural productions for children. CIEC-UM internationalisation includes international publications, international advanced training (PhD students and post-docs from other countries) and participation in international projects. Research collaboration occurs with Portuguese speaking countries (Brazil, Angola, Mozambique, Guinee-Bissau, Cape-Vert and East Timor) as well as with most of the European countries and several others from other continents. CIEC-UM research provides nationwide social impact and knowledge transfer since many Integrated Members are from other national institutions, and the Portuguese PhD students are from all over the country. CIEC-UM has protocols of collaboration with many School Groups and works with local communities across the country (especially municipalities), local childcare institutions and hospitals, assisting in knowledge transfer.



University of Minho Institute of Education Research Centre on Child Studies

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	Full m	nembers		Associated members		
PhD	Internal	External	Total			
	47	13	60	111		
Non DhD	PhD students	Others	Total			
Non-PhD	110	5	115			
	Internation	al mombars	PhD	Non-PhD	Total	
	International men		21	54	75	
Visiting researchers	31					



Total members

1

318

Technical staff

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	17	4	10	3	1	35
Indexed proceedings 6			Book chapters	International 2	National -	Total 2
Number of citations	600					
Publications with international collabor	ation	44%		Journals or collections	Editor	Guest Editor
Publications in top 10% prominence per	Publications in top 10% prominence percentile			Journals of collections	5	-
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	2,4		0,7	1,1		1,4

2. Books

Туре	International	National	Total
Authoring	7	20	27
Edition	1	1	2
Book of proceedings	6	6	12
Outreach book	-	-	-
Non-indexed book chapters	51	69	120
Educational book	-	-	-

3. Non indexed indicators

Journals	69
Proceedings	70

UMinho Repositoriur		en access documents 146	Τς	tal downloads 77.663	Others
	Intern	national	Na	tional	
Communications	Oral	Poster	Oral	Poster	
	237	52	140	19	

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On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	306.642 €	99.277 €
	Others	2	235.096 €	30.961 €
	Total	4	541.738 €	130.238€
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	1	1.000 €	1.000 €
	Others	1	17.728€	1.650€
	Total	2	18.728 €	2.650 €
Tota	al (National + International)	6	560.466€	132.888 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	-	-	-
International meetings organization	4		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	8	8

Theses and Dissertations

Theses and dissertations			
PhD theses completed	13		
		In cooperation with international institutions	1
On-going PhD theses	111		
		In cooperation with international institutions	11
Master dissertations completed	85		

Major achievements

Flagship publications

Learning to be a teacher: mentoring, collaboration and professional practice

European Journal of Teacher Education (2019) 42 (5). 535-538.

The development of vocabulary and grammar: a longitudinal study of European Portuguese speaking toddlers

Journal of Child Language (2019) 46 (4). 653-681.

A selection of relevant portuguese children' literature published in the period of world war I Libri & Liberi (2019) 7 (2). 247-259.

Exercise in Pregnancy: The Impact of an Intervention Program in the Duration of Labor and Mode of Delivery

Revista Brasileira de Ginecologia e Obstetrícia (2019) 41 (2). 68-75.

Prevalence of children exposed to secondhand smoke at home and in the car in Azores (Portugal)

Pulmonology (2019) 25 (5). 283-288.

Flagship projects



The Language of cyberbullying: forms and mechanisms of online prejudice and discrimination in annotated comparable corpora of Portuguese and English

"The Language of cyberbullying" is an international research project funded by the portuguese "Fundação para a Ciência e Tecnologia". The main aim is to analyze the linguistic forms and the pragmatic strategies of persecution and segregation in computer-mediated communication.



The European Family Support Network. A bottom-up, evidencebased and multidisciplinary approach" (EuroFam-Net)

EurofamNet aims to create a pan-European family support network focused on family support policies and practices, reflecting common goals across participating countries, while recognizing the specific nature of families' cultural and socio-economic contexts within them.



Brazilian and Portuguese Children's Social Representations on vaccination: guidelines for health education

EurofamNet aims to create a pan-European family support network The number of people who stop taking vaccines in the world has increased. This project investigates 5th-grade children's Social Representations in Brazil and Portugal on vaccination, to indicate ways for educational proposals in Science Education.

Scientific recognition

Women in Science

"Ciência Viva" paid tribute to 109 Portuguese women scientists whose remarkable work has been instrumental in the progress that national Science and Technology", launching in 2019 the book "Women in Science" with the portrait of these researchers. Graça S. Carvalho was one of them.



ICET Research Award

Presented by the International Council for the Education of Teachers (ICET) Committee on Education Research and Dissemination, it was for the first time granted to a Portuguese academic, Maria Assunção Flores, in recognition of investigations contributing to the worldwide knowledge base of teacher education.



Scientific leadership



ESERA Member

Graça Simões de Carvalho, Board member of the European Science Education Research Association (ESERA). Graça S. Carvalho is member of the ESERA Executive Board (ESERA – European Science education Research Association) with the specific task of organising the 2021 online Conference: https://esera2021.org/.



National Reading Plan

Fernando Azevedo is member of the Honorary Committee of the National Reading Plan (PNL). He is often asked about strategies and methodologies for reading practices among not only general public, but especially among young students. His essays and papers are important pieces for the connection between theory and practice.

COMMUNICATION AND SOCIETY RESEARCH CENTRE

CECS is Portugal's leading Communication Sciences Research Unit – a consolidated, creative and dynamic team. Evaluated by FCT as Excellent since 2008 and internationally renowned, the Centre focuses on the following scientific domains: media literacy, communication and cultural policies, visual and sound culture, intercultural communication, cultural studies, organizational and strategic communication, science communication, social challenges (ageing, health, disability...), media, digital languages and journalism.

From the outset, CECS has played a crucial role in strengthening this scientific field in Portugal and abroad, especially in Portuguese and Spanish-speaking countries. The group invests in collaborative activities, developing strong links with some of the most relevant global research networks, task forces and associations – such as Sopcom, EuroMedia Research Group, ECREA, IAMCR, Lusocom and

Confibercom – and has forged partnerships with a series of relevant regional, national and international actors.

CECS' mission is oriented towards the following core objectives: pursuing cutting-edge research in media and communication; contributing to social and cultural development; producing research to enhance the development of sustainable societies; emphasizing the community dimension of communication, as an essential factor for the development of welcoming, inclusive and peaceful communities; and encouraging and supporting young researchers. CECS operates in four main fields: research, intervention, education and publication. The research team is organised into three groups: Communication, Organisations and Social Dynamics; Cultural Studies; and Media and Journalism.

Communication with, and for, communities is the leitmotiv of CECS' strategic project. This vision depends upon a critical and responsible



outlook towards the media, the quality and diversity of intercultural relations, and the quality and solidity of democracy.

For this reason, the Centre's strategic project focuses on studying and discussing the role played by media and communication systems, providing citizens with high quality information and enhancing promising futures.

CECS publishes two well reputed scientific journals: Comunicação e Sociedade, the main journal in Communication Sciences in Portugal, and the Lusophone Journal of Cultural Studies. The Centre's commitment to society is expressed through two observatories (POLObs – Observatory of Communication and Cultural Policies; MILObs – Observatory of Media, Information and Literacy); two cultural platforms (Virtual Museum of Lusophony, and Passeio, a platform of art and urban culture), and the Think Tank Communitas.

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Director

Moisés de Lemos Martins

Vice-director

Rita Ribeiro Teresa Ruão

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Total members

🛉 Staff

	Full m	embers		Associated members			
PhD	Internal	External	Total				
	51	20	71	43			
	PhD students	Others	Total				
Non-PhD	90	9	99				
	Internetion	-1	PhD	Non-PhD	Total		
	Internation	al members	10	35	45		
Visiting researchers	14						
Technical staff	4						



Publications

1. Journals and proceedings (SCOPUS)

		Q1	Q2	Q3	Q4	Non-rated	Total
	Indexed journals (Scimago quartile) 22	12	21	4	-	59
	Indexed proceedings 2			Book chapters	International 1	National -	Total 1
	Number of citations	579					
	Publications with international col	aboration	10%			Editor	Guest Editor
	Publications in top 10% prominence percentile		16%		Journals or collections	3	6
				SCOPUS		Cla	arivate Analytics
	Average impact of publications	CiteScore		SJR	SNIP		IF
		2,0		0,6	0,9		1,2
2.	Books						
	Туре	International	National	Toto	al		
	Authoring	1	8	9			
	Edition	11	9	20	1		
	Book of proceedings	2	2	4			

3. Non indexed indicators

Non-indexed book chapters

Outreach book

Educational book

Journals Proceedings	2 4		Journ	als or collections	Editor 17	Guest editor -	
UMinho Repositorium	Open d	access documents 176		Total downloads 126.555		Others	16
Communications	<i>Internatio</i> Oral 190	onal Poster -	Oral 185	National Poster -			

-

38

2

-

57 2

-

19

-

On-going research projects and funding for the Centre

National Funding Portugal 2020 Programme		№ of on-going projects	Total funding	Funding executed in 2019
		6	1.454.599€	212.724€
	Others	1	26.142 €	6.510€
	Total	7	1.480.741 €	219.234 €
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	2	1.504.048 €	407.548 €
	Others	1	115.999€	32.569€
	Total	3	1.620.047€	440.116 €
Tota	al (National + International)	10	3.100.787 €	659.350 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	1	1
International patents	-	-	-
International meetings organization	42		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	6	32	38

Theses and Dissertations

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Theses and dissertations			
PhD theses completed	22		
		In cooperation with international institutions	4
On-going PhD theses	90		
		In cooperation with international institutions	1
Master dissertations completed	20		

Major achievements

Flagship publications

Comunicação e Sociedade: Intercultural communication and mediation in contemporary societies *Comunicação e Sociedade* (2019) Vol. Especial.

RLEC: Resignifications of festivities and community identities

Revista Lusófona de Estudos Culturais/Lusophone Journal of Cultural Studies (2019) 6 (2).

Políticas da língua, da comunicação e da cultura no espaço lusófono

Políticas da língua, da comunicação e da cultura no espaço lusófono (2019).

Forensic DNA evidence in transnational policing and judicial cooperation in the EU: police epistemic culture and boundary work

New Genetics and Society (2019) 38 (3). 289-307.

The role of landscape as a visual semiotic resource in Porto tourist campaign. Case study on "European Best Destination 2017"

Semiotics and Visual Communication III Cultures of Branding (2019). 291–319.

Flagship projects



EXCHANGE – Forensic Geneticists and the Transnational Exchange of DNA data in the EU: Engaging Science with Social Control, Citizenship and Democracy

The EXCHANGE project explores the societal, cultural, ethical, regulatory and political impacts of the implementation of Prüm Decisions in the European Union.



SHARE- Survey of Health, Ageing and Retirement in Europe

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a research infrastructure for studying the effects of health, social, economic and environmental policies over the life-course of European citizens and beyond.



CreE.A – Creation of a European Mediation Space for Social Inclusion

The role of landscape as a visual semiotic resource in the Porto tourism campaign. Case study on "European Best Destination 2017".

Scientific recognition

Helena Sousa: IAMCR Distinguished Contribution Award

The CECS researcher was honoured with this distinction, which recognised her systematic and exceptional work for the development of knowledge and international research networks within IAMCR.



Felisbela Lopes: Scientific Merit Award - Coordination Units of ISCSP

This distinction is shared with the researcher Paula Espírito Santo with whom Felisbela Lopes wrote the article "Marcelo Rebelo de Sousa, the popular president who has all the media coverage: Content analysis of the press (2016-2018)".



Albertino Gonçalves: Honorary Citizen of Melgaço

The ceremony took place at the Noble Hall of Melgaço City, on October 26, where were honored citizens and institutions of Melgaço that were noted for their personal merits and civic deeds and for all their work for the community.



Scientific leadership



Moisés de Lemos Martins: Secretary General of the Ibero-American Association of Communication Science Researchers (AssIbercom)

As part of a team led by Cicília Peruzzo, from the University Anhembi Morumbi, in São Paulo, Moisés de Lemos Martins resumes his management duties in the Ibero-American space, after having chaired Confibercom between 2012 and 2015.



Ana Duarte Melo: vice-chair of the Participatory Communication Research Section of IAMCR

Ana Melo was elected vice-chair in 2016, with Nico Carpentier and Jonas Agerbaek Jeppese.



Ana Maria Silva: secretary of the board of EstreiaDiálogos

This Lusophone network aims to promote a democratic and inclusive investigative approach and includes the participation of researchers, students and professionals from various fields.

CENTRE OF STUDIES IN GEOGRAPHY AND SPATIAL PLANNING

CEGOT is a non-profit research and development unit whose main goal is to pursue, advance and share scientific knowledge in the areas of social and economic geography and earth and related environmental sciences.

More specifically, CEGOT develops state-of-the-art research in: geomorphology, climatology and hydrologic dynamics; environmental landscape dynamics; natural risks; physical support in spatial planning; economic geography; competitiveness and innovation; urban geography and spatial planning; health geography; tourism; and spatial dynamics and development.

Although research synergies between its group members have existed for a much longer period, CEGOT was officially recognized by FCT in December 2008. The Centre is constituted of members of the Geography Departments of three host universities in Central and Northern Portugal: Coimbra, Minho and Porto.

Today, CEGOT is home to 148 researchers (71 integrated, 77 collaborators). Most of the integrated members are professors/researchers at their universities and are complemented by a significant number of doctoral and post-doctoral researchers that are either pursuing their own investigations (many with FCT scholarships) or working in research projects coordinated by CEGOT. Most members have a background in Geography, but, over the years, CEGOT has also attracted researchers from Urban Planning, Architecture, Sociology, Economics, Engineering, Public Health and Tourism, strengthening its multidisciplinarity. This is directly associated with the vision of CEGOT that to tackle contemporary societal challenges - climate change, demographic change, economic transitions or social and health inequities – a collaborative, holistic and territorial-based approach is needed,



albeit grounded in a geographical understanding of the world. CEGOT aims to continue to provide strong, action-oriented contributions to science and society in order to respond to the most current and impending challenges at various geographical scales. To do this, CEGOT wishes to strengthen its existing national and international reputation as a hub of scientific advancement and learning in key areas of geographical knowledge, whilst nurturing a more permanent and fluid connection between research, policy and society through a comprehensive and open diffusion strategy.

At UMinho the research Centre (CEGOT-UMinho) is part of the Social Sciences Institute and is constituted by 15 researchers. In the last 2019 evaluation carried out by the FCT, the Centre was awarded with the grade of Very Good.

Director

António Avelino Batista Vieira

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🕴 Staff

	Associated members			
PhD	Internal	External	Total	
	7	2	9	2
Non-PhD	PhD students	Others	Total	
	4	-	4	
Visiting researchers	-			
Technical staff	-			

Total members 15



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	-	-	-	-	-	-
Indexed proceedings -						
Number of citations	31					

2. Books

Туре	International	National	Total
Authoring	-	1	1
Edition	-	-	-
Book of proceedings	1	1	2
Outreach book	-	-	-
Non-indexed book chapters	4	2	6
Educational book	-	1	1

3. Non indexed indicators

Journals	6			
Proceedings	10			
UMinho Repositorium		Open access documents 3		Total downloads 8.614
	li	nternational		National
Communications	Oral	Poster	Oral	Poster
	36	-	27	-

\leftrightarrows Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
	National patents	-	-	-
	International patents	-	-	-
	International meetings organization	5		
	Spin-offs and Start-ups with UMinho label	-		
	Others (consultancy, exhibitions, observatories and technical reports)	International	National	Total
		-	2	2

Theses and Dissertations

Theses and dissertations	
PhD theses completed	-
On-going PhD theses	18
M . P	4
Master dissertations completed	4

Major achievements

Flagship publications

Competition, Conflict, and Conformity: Foreign Policy-Making in the First Year of the Trump Presidency

Presidential Studies Quarterly (2019) 49 (2). 280–309.

Assessing State Partition as a Conflict Management Strategy in Sub-Saharan Africa

In Ludwig, Fernando and Luciano Barros (Eds.) (Re)Definições das Fronteiras: Desafios para o Sécu-Io XXI (2019) 3. Foz de Iguaçu, Brazil: Editora IDESF.

O planeamento urbano e o princípio da regulação variável: rigidez versus flexibilidade

Colecção Ensino. Guimarães: UMDGEO – Departamento de Geografia da Universidade do Minho (2019) 37 p. ISBN: 978-989-98857-4-5.

O arquivo da Agência Portuguesa do Ambiente: contributos geográficos para o estudo dos rios do norte de Portugal

ParaOnde!?, Porto Alegre (2019) 12 (2). 238-251.

A geoconservação no contexto do Antropoceno: desafios e oportunidades

III Encontro Luso-Brasileiro de Património Geomorfológico e Geoconservação (2019) 4 Guimarães: CEGOT-UMinho. 394 p. ISBN: 978-989-54317-5-5.

Flagship projects



Environmental Protection in Central Asia (EPCA): Disaster Risk Management with spatial methods

Funded by the European Commission the project aims to meet the needs of the labor market with the provision of geospatial education and increase the knowledge and operational skills of SIST and its applications to improve disaster management in countries Europe and Central Asia. http://eu-epca.eu/



Atlas of the Video Game Industry in Portugal 2020

The project aims to map and characterize this sector on a national scale, using a diversified methodology that involves the survey of its main agents and detailed characterization, through representative surveys of companies as well as to independent creators.



Soil Protec - Emergency measures to protect soils after forest fires

The project Soil Protec aims to test low cost treatments to reduce soil erosion immediately after low/medium intensity forest fires in Pinus pinaster stands in the northwest of Portugal.

Scientific leadership



President of the Portuguese Association of Geomorphologists

APGeom was created in 2000 with the objective of joining efforts, taking common initiatives, defending rights, and, above all, promoting scientific knowledge within the scope of Geomorphology and its application in several areas of national interest. It is affiliated with the International Association of Geomorphologists.



Vice-President of RISKS - Portuguese Association of Risks, Prevention and security

Portuguese Association of Risks, Prevention and Security, is a private, non-profit association that brings together citizens and institutions that have responsibilities in risk management, from prevention to the rehabilitation of the areas affected by them, or who ensure the safety of people and their property. https://www.riscos.pt/



Member of the Direction board of the Portuguese Association of Geographers

APG is a professional association that aims to contribute to the professional development and the correct deontological performance of geographers in order to better serve society and the territory, fostering, developing and disseminating Portuguese geographic science and its applications. https://www.apgeo.pt/

INTERDISCIPLINARY CENTRE OF SOCIAL SCIENCES

CICS.NOVA.UMinho is a unit at UMinho of CICS.NOVA, created in 2015, as the result of a synergetic merges of: CESNOVA – Centre for Sociological Studies and e-GEO – Centre for Geography and Regional Planning, both hosted by NOVA FCSH, and CICS – Research Centre for Social Sciences hosted by UMinho. CICS.NOVA is one of the largest Research Units with national scope. Located in Lisbon, it has poles at UMinho, University of Évora, University of the Azores and Polytechnic Institute of Leiria. It has several Laboratories and Observatories.

CICS.NOVA.UMinho's mission is to produce and promote knowledge in the areas of Sociology and other Social Sciences, based on the freedom of thought and the diversity of critical thinking, while also aiming for the promotion of knowledge transfer activities and intervention in the community, in order to contribute to a more unified, just and cohesive society. CICS.NOVA.UMinho develops innovative and high quality interdisciplinary research in the field of social sciences to support the design of public policies in their areas of expertise. It attributes the same preponderance to fundamental and applied research from an interdisciplinary point of view, taking into account their relationship to the surrounding spatial and social contexts, and fostering opportunities for cooperation between researchers, organisations and individual civil society actors. Currently, the unit integrates a range of researchers in different research groups, which include: "Social Inequality and Public Action", "Citizenship, Work and Technology" and "Environmental Change, Territory and Development".



The vision that CICS.NOVA.UMinho has for the near future and the goals proposed in its strategic programme are based on a solution of continuity in light of a recent past, while also including more critical mass, innovating and creating new management solutions that are translated into an improvement in terms of research, its organisation level, internationalization and external visibility. The solid investment in scientific dissemination through the edition of publications, such as the journal Configurações, indexed in international databases, CICS.NOVA.UMinho e-books and Working Papers ComTextos, as well as the organisation of advanced training and scientific events, are activities that the Centre determines as a priority in order to achieve this strategy.

Director

Ana Maria Simões de Azevedo Brandão

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🛉 Staff

		Full m	Associated		
	PhD	Internal	External	Total	
		8	6	14	(
		PhD students	Others	Total	
	Non-PhD	13	5	18	
	Visiting researchers	1			
	Technical staff	1			
Tot	al members	41			





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	5 Q4	Non-rated	Total
Indexed journals (Scimago quartile)	2	2	1	1	-	6
Indexed proceedings -						
Number of citations	15					
Publications with international collab	Publications with international collaboration Publications in top 10% prominence percentile			Journals or collections	Editor	Guest Editor
Publications in top 10% prominence			0%		5	1
			SCOPUS		Cl	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	1,4		0,5	0,7		0,8

2. Books

Туре	International	National	Total
Authoring	1	2	3
Edition	2	6	8
Book of proceedings	-	1	1
Outreach book	-	1	1
Non-indexed book chapters	6	20	26
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	14 12		Jourr	nals or collections	Editor 8	Guest editor -	
UMinho Repositorium	Open a	ccess documents 5		Total downloads 3.275		Others	18
Communications	International Oral Poster		Oral	National Poster			
commanications	38	-	27	-			

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	1	189.654€	52.425 €
	Others	-	-	-
	Total	1	189.654€	52.425 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Total (National + International)		1	189.654 €	52.425€

\leftrightarrows Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
	National patents	-	-	-
	International patents	-	-	-
	International meetings organization	7		
	Spin-offs and Start-ups with UMinho label	-		
	Others (consultancy, exhibitions, observatories	International	National	Total
	and technical reports)	4	5	9

Theses and Dissertations

Theses and dissertations PhD theses completed	2
On-going PhD theses	25
Master dissertations completed	24

Major achievements

Flagship publications

Persecution or Recognition? Abolitionism, self-determination and recognition of rights of sex workers Gazeta de Antropologia (2019) 35 (1).

Fiscal Policy in Early Modern Europe: Portugal in Comparative Context

Routledge (2019).

Resource-Based View of City Quality: Scales and Validation

Growth and Change: A Journal of Urban and Regional Policy (2019) 50 (3). 856-879.

Peasants, brokers and the state: competition and dividends in familist local politics in two villages in the Northwest of Portugal

Cuadernos de Desarrollo Rural, (International Journal of Rural Development), Bogotá, Colombia (2019) 16 (83). 5.

Acess to Law and Justice Perceived by Foreign and Roma Prisioners

Race and Justice (2019) 9.

Flagship projects



Ways of life and modes of inhabiting: social housing in poor neighbourhoods in Oporto and Braga

Project Reference PTDC-SOC/4243/2014, coordinated by Manuel Carlos Silva. Funded by Fundação para a Ciência e Tecnologia. http://www. lasics.uminho.pt/dsac/index.php/projeto/



"The 'Marco dos Navios': Portugal's tonnage taxation on vessels and its contribution to trade and fiscal system during the Royal Treasury Period, c. 1761-1833"

Coordinated by Rodrigo da Costa Dominguez. Funded by Fundação para a Ciência e Tecnologia/Universidade do Minho. https://www.cics. nova.fcsh.unl.pt/people/integrated-researchers/rodrigo-dominguez

Scientific recognition

Ana Paula Marques recognized as one of the most influencial female scientists in Portugal. Prize awarded by Ciência Viva

(http://cics.uminho.pt/?p=10438&lang=pt)



Scientific leadership



CICS hosts the presidence of Economic and Business History Society

Rodrigo da Costa Dominguez - President elected for Economic and Business History Society (EBHS) - EUA (https://ebhsoc.org/about/).

CENTRE FOR RESEARCH IN ANTHROPOLOGY PORTUGAL

Founded in 2007, CRIA is the main Portuguese research Centre in Anthropology, occupying a significant position in the institutional field of Portuguese social sciences. It is an interuniversity R&D unit – composed by ISCTE-IUL, NOVA FCSH, University of Coimbra and UMinho, with shared management, fundraising, research dissemination, teaching and knowledge transfer capabilities. In the 2019 evaluation carried out by the National Science Foundation (FCT), CRIA was awarded with the grade of Very Good.

CRIA is a mature project and a stimulating multi-dimensional space of anthropological research. It is a unique and innovative project at the European level, and its institutional brand is internationally recognized and valued. CRIA will develop this leverage by promoting international collaborations in research and dissemination, attuned to debates in anthropology and relevant interventions in the public sphere. Bringing together scholars from multiple and intersecting anthropological traditions, CRIA intervenes in the geopolitical restructuration of anthropological discourse and analysis, launching creative dialogues between bodies of knowledge frequently kept apart.

CRIA makes a solid contribution to the knowledge of contemporary cultural and social dynamics. Research in Portugal along with various geographical contexts – Portuguese-speaking countries (Brazil, Angola, Mozambique, Guinea-Bissau, Cape Verde, São Tomé and Príncipe, East Timor), other European countries, and India, Malaysia, Indonesia, Bangladesh, Sri Lanka, Sierra Leone, Morocco, Mauritania, Madagascar, Israel, Palestine, Canada, USA, Cuba - promotes comparative, articulated and transversal analyses on different spatial and historical scales – the landmark of CRIA's scientific strategy. Interdisciplinarity and subdisciplinary articulation support and complement this unique approach.



Research in CRIA is structured in four major research groups which compose the scientific core of the Centre and bring together researchers from the different institutional divisions. These groups build upon specific fields of research: (1) Circulation and Place-Making, (2) Environment, Sustainability, and Ethnography, (3) Governance, Policies and Livelihoods, and (4) Practices and Politics of Culture. In conjunction with the research activities, CRIA also promotes the organisation of scientific meetings and several activities outside the academy that favour the discussion and dissemination of research results, and encourages the publishing of articles and books that facilitate the circulation of research in anthropology. Namely, CRIA's journal Etnográfica is the main journal in anthropology published in Portugal, being listed in significant international databases (e.g. Web of Knowledge, Scopus, AIO, EBSCO, Latindex, Capes Qualis, ERIH Plus).

Director

Luís Cunha (CRIA-UM) José Mapril (CRIA)

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🕴 Staff

		Full members		
	PhD	Internal	External	Total
		3	4	7
	Non-PhD	PhD students	Others	Total
		-	-	-
	Visiting researchers	-		
	Technical staff	-		

7

Total members


Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	-	-	-	-	-	-
Indexed proceedings -						
Number of citations	46					
Publications with international collabor	ation	-				
Publications in top 10% prominence pe	rcentile	-				

2. Books

Туре	National
Authoring	2
Edition	1
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	1
Educational book	-

3. Non indexed indicators

Journals	3					
Proceedings	-					
UMinho Repositorium	Open	access documents -		Total downloads 3.275	 Others	1
Communications	<i>Internat</i> Oral 8	ional Poster -	Oral 5	National Poster -		



Theses and dissertations			
PhD theses completed	4		
		In cooperation with international institutions	4
On-going PhD theses	7		
		In cooperation with international institutions	5
Master dissertations completed	4		

Major achievements

Flagship publications

Criminalidade e Segurança

(2019) Lisboa, Fundação Francisco Manuel dos Santos. 105.

Folgar rapazes, folgar, folgar! As festas nicolinas em Guimarães

(2019) Guimarães, Município de Guimarães. 214.

Moors versus christians: from the difference explaining war to the cultural encounter

Revista Lusófona de Estudos Culturais / Lusophone Journal of Cultural Studies (2019) 6 (2). 37-49.

Foreign national woman arrested for drug trafficking: a dynamic socio-penal portrait

Prisons, State and Violence, Basel, Springer (2019). 115–128.

Do fundo da cozinha ao reino da Abissínia: etnografia, imagens e narrativas

Cadernos de Arte e Antropologia (2019) 8 (2).

Flagship projects



LIVEPOLITICS - Governação, transformações políticas e negações de quotidianos: Portugal, 2008-2018

The project's aim is to analyze how legislative changes affect the everyday functioning and decision-making of institutions as well as citizens' personal and social life experiences, including plans for the future. Through a detailed examination of the ways in which categories of citizens in different sectors of society experience the law through a range of institutions, the project will focus on how popular conceptions of justice and injustice and of the legitimacy of policies emerge through the constitution of moral communities.



Articulação em ciências humanas e sociais: desafios contemporâneos dos direitos humanos na América Latina e Europa

This project gathers researchers and post-graduate students from selected European and Latin Universities working on migrations, identity, family and gender, sexual and reproductive rights, prisons and imprisonment, with the aim to cross-examine different aspects of social and psychological suffering and alternative forms of intervention.



Elaboração da ficha de inscrição da romaria da Senhora do Alívio no INPCI

Historic and ethnographic study, commissioned by the township of Vila Verde, of the religious festival Romaria da Senhora do Alívio, with a view to its inscription in the Inventário Nacional do Património Cultural Imaterial.

3B'S RESEARCH GROUP

The 3B's Research Group (Biomaterials, Biodegradables and Biomimetics) was established in 1998 at the UMinho and supports a multidisciplinary and highly skilled team working at the interface of biomedical engineering, materials science, biotechnology and life sciences. It is now a Unit of the recently created Research Institute on Biomaterials, Biodegradables and Biomimetics (I3Bs), a "Unidade Orgânica de Investigação" of UMinho that also integrates the 3B's Innovation & Services Units. The 3B's is part of Portuguese Government Associate Laboratory ICVS/3B, evaluated in 2019 by FCT with the grade of Very Good, together with the Institute of Health and Life Sciences, also from UMinho.

The research activity of 3B's is focused on the development of new biodegradable or biomimetic biomaterials, as well as on human stem cell sourcing and differentiation, towards new solutions that

may lead to relevant patient-centred clinical applications. These include regeneration of human tissues and organs, advanced therapies against cancer and degenerative diseases. 3B's is among the leading groups in Tissue Engineering and Regenerative Medicine worldwide. It has established long-term collaborative partnerships with major research groups in Europe, Asia, and North America providing opportunities for student and postdoctoral exchange programs and joint research projects. Moreover, the innovation character is clear, building an important Intellectual Property asset: it is the research group with more patent applications in Portugal and several spin-offs are arising.

The 3B's coordinates the European Institute of Excellence on Tissue Engineering and Regenerative Medicine. It aims to strengthen its research thematic areas and its competences to consolidate its



leading position worldwide, contributing with scientific knowledge and political influence to address European health-related societal challenges. The 3B's Research Group has been one of the most active groups in Europe on attracting highly competitive large grants for research, educational programs, and supporting infrastructure. This strategy has been also positioning the Group as a continuously growing and world-respected Centre on Biomaterials, Tissue Engineering and Regenerative Medicine research.

Director

Rui Luis Reis

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3B's Research Group 13Bs - Research Institute on Biomaterials, Biodegradables and Biomimetics of University of Minho Headquarters of the European Institute of Excellence on Tissue Engineering and Regenerative Medicine AvePark - Parque de Ciência e Tecnologia, Zona Industrial da Gandra 4805-017 Barco Guimarães Portugal

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Universidade do Minho

Research Institute on Biomaterials, Biodegradables and Biomimetics

🕴 Staff

	Full m	embers	ers Associated membe		
PhD	Internal	External	Total		
	86	-	86	5	
Non DhD	PhD students	Others	Total		
Non-PhD	86	44	130		
	Internation	International members		Non-PhD	Total
	Internation			8	26
Visiting researchers	26				
Technical staff	13				



Total members 260

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	70	19	1	0	-	90
Indexed proceedings 11			Book chapters	International 5	National -	Total 5
Number of citations	5.680					
Publications with international collabo	oration	55%			Editor	Guest Editor
Publications in top 10% prominence p	ercentile	11%		Journals or collections	4	1
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	9,7		1.7	1,5		6,2

2. Books

Туре	International	National	Total
Authoring	13	1	14
Edition	3	-	3
Book of proceedings	8	-	8
Outreach book	-	-	-
Non-indexed book chapters	16	-	16
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	4 7		Journa	ls or collections	Editor 2	Guest editor 2	
UMinho Repositorium	Оре	n access document. 31	S	Total downloads 29.028		Others	1
Communications	<i>Intern</i> Oral	ational Poster	N Oral	<i>ational</i> Poster			
	80	187	17	-			

On-going research projects and funding for the Centre

	National Funding	<i>№</i> of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	41	24.161.833€	4.316.165 €
	Others	12	1.938.298 €	221.163 €
	Total	53	26.100.131€	4.537.328 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	17	17.518.151 €	1.452.467€
	Others	9	1.241.262 €	187.871€
	Total	26	18.759.413€	1.640.338 €
Т	otal (National + International)	79	44.859.544 €	6.177.666 €

\leftrightarrows Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
Na	ational patents	12	-	12
Int	ternational patents	28	1	29
Int	ternational meetings organization	10		
Sp	in-offs and Start-ups with UMinho label	-		
Ot	hers (consultancy, exhibitions, observatories	International	National	Total
	and technical reports)	15	0	15

Theses and Dissertations

There and discontations

Theses and dissertations			
PhD theses completed	4		
		In cooperation with international institutions	4
On-going PhD theses	64		
		In cooperation with international institutions	15
Master dissertations completed	8		

Major achievements

Flagship publications

A textile platform using continuous aligned and textured composite microfibers to engineer tendon-to-bone interface gradient scaffolds Advanced healthcare materials (2019) 8 (15). 1900200.

Mechanical property of hydrogels and the presence of adipose stem cells in tumor stroma affect spheroid formation in the 3D osteosarcoma model ACS applied materials & interfaces (2019) 11(16). 14548-14559.

Enzymatically cross-linked silk fibroin-based hierarchical scaffolds for osteochondral regeneration

ACS applied materials & interfaces (2019) 11 (4). 3781-3799.

Minimalistic supramolecular proteoglycan mimics by co-assembly of aromatic peptide and carbohydrate amphiphiles

Chemical science (2019) 10 (8). 2385-90.

Interfollicular epidermal stem cells: boosting and rescuing from adult skin

InSkin Stem Cells (2019). 101-110.

Flagship projects



FET Flagship Innitiative

An academia-industry partnership that gathers experts in medicine, basic research, technology development and engineering for the progress of Advanced Therapies.



Algavalor

The ALGAVALOR project aims at the integrated production of microalgae and the valorisation of their biomass and extracts in different applications, such as human food, animal nutrition, cosmetics and biofertiliser markets.



BlueBioLab

Aims to create a transboundary marine biotechnology laboratory that promotes excellence in R&D, internationalizes R&D&I capacities and optimizes the use of research infrastructures in the territory of Galicia and Northern Portugal.

Scientific recognition

Rui Reis Career Achievement Award of the Tissue Engineering and Regenerative Medicine International Society, TERMIS-EU

The major senior career European scientific award in this scientific area, being the only World Scientist with Career and Contributions to the Literature Awards both in Biomaterials and in Tissue Engineering and Regenerative Medicine.



Scientific leadership



Rui L. Reis Immediate Past President of TERMIS Global

From 2019-2021 Rui L. Reis is the Past-President of Tissue Engineering and Regenerative Medicine International Society (TERMIS) Global, the main International Society in his field of Research.



Rui L. Reis and Manuela E. Gomes Editors of the "Encyclopedia of Tissue Engineering and Regenerative Medicine"

Rui L. Reis and Manuela E. Gomes edited the Encyclopedia of Tissue Engineering and Regenerative Medicine whichprovides a comprehensive collection of personal overviews on the latest developments and likely future directions in the field.

LANDSCAPES, HERITAGE AND TERRITORY LABORATORY

Lab2PT, Landscapes, Heritage and Territory Laboratory, is a R&D unit of UMinho focused on Social Sciences, Arts and Humanities and evaluated as Excellent by the National Science Foundation (FCT). Currently, it comprises 61 PhD integrated researchers from different scientific areas (Archaeology, Architecture and Urbanism, Design, Geography, Geology, History and Visual Arts), 43 PhD students, and other Post-doc fellows or collaborators. Such a critical mass converges to a common interest in the study of the territory, its landscapes and heritage, which are understood as the material, spatial and cultural expressions of societies over time. Lab2PT's truly interdisciplinary basis of research is ensured by its organic articulation with two schools of UMinho - the School of Architecture and the Institute of Social Sciences, merging research and teaching programmes. This unit is formed by three research groups, designed according to their identity and goals: Landscapes and Societies (LandS), Design and Technology (DeTech) and Space and Representation (SpaceR), each group comprising researchers from different scientific areas.

Lab2PT develops fundamental and applied research, thriving on its laboratorial capacity, namely the Unit of Archaeology of UMinho, the Laboratory of Construction and Technology or the Design Institute of Guimarães and its Advanced Ceramics R&D Lab. It wishes to understand and interpret territories and their natural and cultural landmarks, assuming heritage resources that can and should promote economic and social strategies within regional (partnerships with municipalities), national (collaborations with other Research



Units and public stakeholders) and international (representation and leadership in networks) contexts.

The activity plan for Lab2PT is guided by 4 major objectives, wishing to approach the territory from a holistic perspective that crosses the three research groups: 1) to deepen fundamental multidisciplinary research; (2) to foster applied research with territorial and social impact for development services; 3) to extend the articulation between research and postgraduate training; 4) to expand the internationalization of the team, projects and the results of research.

Director

Paula Cristina Almeida Cadima Remoaldo

Vice-director Jorge Manuel Simão Alves Correia

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Laboratory of Landscapes, Heritage and Territory

🕴 Staff





Publications

1. Journals and proceedings (SCOPUS)

		Q1	Q2	Q3	Q4	Non-rated	Total
L	Indexed journals (Scimago quartile)	12	4	5	1	-	22
l	Indexed proceedings 15						
	Number of citations	407					
Ľ	Publications with international collab	oration	11%		Journals or collections	Editor	Guest Editor
	Publications in top 10% prominence percentile		11%		Journals of collections	6	2
Ľ				SCOPUS		Cla	arivate Analytics
	Average impact of publications	CiteScore		SJR	SNIP		IF
		2,3		0,6	0,8		2,2
. E	Books						

2.B	ooks	
	Туре	

Туре	International	National	Total
Authoring	6	11	17
Edition	6	15	21
Book of proceedings	-	1	1
Outreach book	-	-	-
Non-indexed book chapters	53	37	90
Educational book	3	6	9

3. Non indexed indicators

Journals Proceedings	67 45		Jourr	nals or collections	Editor 85	Guest o 1	editor
UMinho Repositorium	Ope	n access documents 22		Total downloads 2.813	1	Other	s 15
	Interne	ational		National			
Communications	Oral	Poster	Oral	Poster			
	158	6	80	6			

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	494.828 €	161.099€
	Others	6	251.604€	49.895 €
	Total	8	746.432 €	210.994€
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	1	84.190 €	55.341 €
	Total	1	84.190 €	55.341€
Tota	l (National + International)	9	830.622€	266.335 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	3	-	3
International meetings organization	117		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	24	63	87

Theses and Dissertations

Theses and dissertations			
PhD theses completed	3		
On-going PhD theses	40		
		In cooperation with international institutions	2
Master dissertations completed	87		

Major achievements

Flagship publications

The symbolic meaning of cattle and sheep/goat in Bronze Age: faunal inclusions in funerary contexts of South-Weastern Iberia

International Journal of Osteoarchaeology (2019). 1-11.

What influences a tourist to return to a cultural destination?

International Journal of Tourism Research (2019) 21 (2). 280–290.

O "retrato" do hospital da Misericórdia de Vila Viçosa (Portugal) em 1870

Archivo Iberoamericano de Historia de la Medicina y Antropología Médica (2019) 71 (1). 251.

Hand-Product Contact Point Detection on Surgical Instruments – A User Evaluation *Ergonomics in Design*(2019) 27(4). 14-21.

Evaluating the efficiency of membrane's refurbishment solutions to perform vertical extensions in old buildings using a multicriteria decision-support model

Architectural Engineering and Design Management (2019).

Flagship projects



Creative Tourism Destination Development in Small Cities and Rural Areas (CREATOUR)

CREATOUR is an incubator research, supporting collaborative research processes involving five research centres working with a range of organizations located in small cities across Portugal.



Additive Manufacturing of Innovative and Multifunctional Ceramic Products of Achitectural Systems (KERAMOS)

KERAMOS integrates additive manufacturing techniques of ceramic and architectural components, expanding its functionalities with sustainable performances and applying magnetron sputtered coatings.



Spaces and lifestyles from the Portuguese period in Northern Africa: cities and towns of the "Overseas Gharb" (15th to 17th centuries)

This project focuses on urban landscape and tissues, architectural evidence and archaeological remains, in order to create a (im)material cartography of the Portuguese presence in the region..

Scientific recognition

Building of the Year 2019

André Fontes won the Building of the Year 2019 by Archdaily with the chapels "Imaculada Conceição e Cheia de Graça" em Braga.



Emerging Scholar Award

Inês Graça won the Emerging Scholar Award by The Constructed Environment Research Network at the 9th International Conference on The Constructed Environment, Guimarães, 23-24 May.



Merit Fellowship

Hélder Lopes received the 2019 "Bolsa de Mérito" for the 2014-15 academic year as being the best student of Social Sciences Institute, given by Direção Geral do Ensino Superior (Portugal).



Scientific leadership



President, International Association of Structures and Architecture (IASA): Paulo Cruz

Since 2016, IASA aims to explore and promote the merging of the fields of Structures and Architecture, encompassing all advances in teaching, researching, designing and building of structures.

european architectural history network

Vice-President, European Architectural History Network (EAHN): Jorge Correia

The European Architectural History Network supports, since 2005, research and education by providing a public forum for the exchange and dissemination of knowledge of the histories of architecture.



Vice-President, Côa-Parque Foundation: Maria Manuel Oliveira

Since 2011, Côa Parque Foundation manages the Côa Valley Archaeological Park and Museum, in order to promote integrated development of the region, highlighting the importance of cultural dynamics.

RESEARCH CENTRE IN POLITICAL SCIENCE

The Research Centre in Political Science (CICP) is a R&D Unit with the University of Minho as proponent institution (School of Economics and Management - EEG) and the University of Évora as participating institution. CICP was created in 2015, but its history is longer – dating back to 2002 – because CICP was the result of the merger of two successful units: the Centre for Studies in Public Administration and Politics (NEAPP) and the Research Centre in Political Science and International Relations (NICPRI). The merger was beneficial and the results are clear: two of the country's best centres in Political Science joined their human and intellectual capital to create a unit that is at the top of FCT's ranking with the Excellent grade in 2019. CICP's mission is to achieve the highest level of quality in research in Political Science in Portugal. For this goal, CICP aims at taking a synergistic advantage of its resources and the natural approximation of human capital, working closely in the subfields of the political science spectrum, and a strong commitment to the internationalization through the integration of its members into international networks and projects, as well as publishing its research in scientific journals and books of renowned international publishers. CICP also anticipates the future by investing in the promising potential of PhD students attending its Doctoral Programs.

In order to strengthen CICP's position and recognition, the Centre's members invest in several collaborative activities. Many of the main publications are developed in collaboration with renowned national and international colleagues, and CICP researchers have been participating in international projects, mainly in Brazil and Spain. CICP has been developing strong links and long-term collaborative partnerships with relevant scholars and institutions from Europe and North and South American countries, and cIGAR among many



others, and has built strong relations with foreign universities, like Florida State University, London School of Economics and University of Sao Paulo, just to name a few.

CICP's richness also lies in the articulation of differentiated but complementary perspectives in Political Science based on a principle of teamwork and fine articulation between the four different research groups: (1) Public Policy and Management, with the research lines Public Management, and Policy Making and Policy Evaluation; (2) Governance and Democracy, with the lines Political Behaviour and Multi-level Governance; (3) States, International Organizations and Challenges in Contemporary International Relations, comprising the lines Portugal, European Union and International Security Dynamics; and (4) Society, Europe and Global Dynamics, with the line Power, Rights and Cosmopolitanism in a Global Era.

These different structuring elements form CICP's strength and identity, and the main challenge is simply to continue to grow with rigor and professionalism.

1

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Director

Miguel Ângelo Vilela Rodrigues

Vice-directors

Sandra Dias Fernandes Silvério Rocha e Cunha

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Cicp Research Center in Political Science

🕴 Staff





Total members

Technical staff

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	15	3	1	2	-	21
Indexed proceedings 5						
Number of citations	252					
Publications with international collabo	ration	39%		ournals or collections	Editor	Guest Editor
Publications in top 10% prominence pe	ercentile	4%	,	ournals of collections	-	1
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	3,3		0,8	1,4		2,0

2. Books

Туре	International	National	Total
Authoring	-	5	5
Edition	1	2	3
Book of proceedings	-	-	-
Outreach book	-	-	-
Non-indexed book chapters	7	17	24
Educational book	-	1	1

3. Non indexed indicators

Journals	3					
Proceedings	8					
UMinho Repositorium	Open	access document. 18	5	Total downloads 56.857	Others	1
	Internat			National		
Communications	Oral	Poster	Oral	Poster		
	44	-	4	-		

On-going research projects and funding for the Centre

	National Funding	<i>№</i> of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	1	178.200€	18.037€
	Others	-	-	-
	Total	1	178.200€	18.037€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	I (National + International)	1	178.200€	18.037€

\leftrightarrows Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
	National patents	-	-	-
	International patents	-	-	-
	International meetings organization	-		
	Spin-offs and Start-ups with UMinho label	-		
	Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)		1	1	2

Theses and Dissertations

Theses and dissertations PhD theses completed	2
On-going PhD theses	6
Master dissertations completed	24

Major achievements

Flagship publications

Tangling with the Troika: domestic ownership as political and administrative engagement in Greece, Ireland, and Portugal

Public Management Review (2019) 21 (1). 1265-1286.

The good, the bad and the ugly: Three faces of social media usage by local governments

Government Information Quarterly (2019) 36 (3). 469-479.

Ecological Fiscal Transfers for Biodiversity conservation policy: a transaction cost analysis of Minas Gerais, Brazil.

Ecological Economics (2019) 166. 106425.

The portrayal of early accountants in nineteenth century Portuguese literature

Accounting, Auditing & Accountability Journal (2019) 32 (2). 658-688.

The Meaning of Detention on Life Trajectories and Self-Identities: the Perspectives of Detained Migrants in a Removal Centre in Portugal

Journal of International Migration and Integration (2019) 20 (4). 1137–1159.

Flagship projects



SPACEU2019 – Helping mobile EU citizens to exercise their political rights in EU Parliamentary Elections 2019

Professor Isabel Estrada Carvalhais is the Country Expert of the Project Spaceu2019, a tool created for the 2019 European Parliament elections, specifically adapted for EU citizens who vote in their home country or place of residence.



EU Foreign Policy Facing New Realities: Perceptions, Contestation, Communication and Relations

Laura Ferreira-Pereira is the National Delegate of the COST Action "EU Foreign Policy Facing New Realities" a project aimed at obtaining theoretical advice for the EU's policy and strategic approach in its international relations.



TrivPlat – A monitoring, management and evaluation tool for electronic public procurement

Pedro Camões is the Principal Researcher of the Project "Trivplat", intended to create a platform that reduces the budget of public expenses in the acquisition of goods and services.

Scientific recognition

Enrique Fernández Peña de Historia de la Contabilidad 2019 Award

Delfina Gomes won the Enrique Fernández Peña de Historia de la Contabilidad 2019 Award for the article written with Fernanda Leão and Garry Carnegie "The portrayal of early accountants in nineteenth century Portuguese literature".



Scientific leadership



Co-Editor of the Urban Affairs Review António Tavares is co-editor of Urban Affairs Review.



Global Citizenship Observatory

Isabel Estrada Carvalhais and Catarina Reis Oliveira are the authors of the 2019 Report on Political Participation of Mobile EU Citizens: Portugal, by the Global Citizenship Observatory, Robert Schuman Center for Advanced Studies.

CENTRE FOR RESEARCH IN ECONOMICS AND MANAGEMENT

Founded in 1999, the Centre for Research in Economics and Management (NIPE) is a sub-unit of the School of Economics and Management of the University of Minho. Initially a small research centre, with a more specialized profile in macroeconomics and political economy, the growth of membership broadened NIPE's research interests to other areas of Economics and, more recently, to Management. In the last evaluation performed by the Portuguese Foundation for Science and Technology, NIPE was ranked with Very Good. NIPE's main objective is to foster scientific progress in Economics and Management, translated in publications in leading international journals. Since 2016, NIPE's research activities are organized in four research groups: Industrial and Labour Economics, Macroeconomics, Public and Regional Economics and Management and Finance. NIPE is an internationally oriented research centre. A large number of its members are involved in international research collaborations. The seminar series involves researchers from many foreign universities. Every year, NIPE organizes several events and a very successful Summer School, that attract researchers from all over the world. The research unit also aims to transfer knowledge to economic agents, through the provision of consulting services, that contribute to a better and more scientifically based analysis of the economic environment, and to a more solid foundation of public and private decision-making. Several NIPE members are consultants for private and public entities, the Portuguese government and the parliament, as well as for international organizations such as the World Bank, the United Nations and OECD.



NIPE is a leading research centre on the Portuguese Economy. Its members are actively involved in several research projects that analyse various aspects of the Portuguese economy. The outputs of these projects resulted in many international publications and attracted extensive media coverage. **Director** Linda Gonçalves Veiga

Vice-director Claúdia Simões

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NIPE

Technical staff

Total members

1

95

🛉 Staff

	Full m	embers	Associated members		
PhD	Internal	External	Total		
	37	-	37	25	
Non-PhD	PhD students	Others	Total		
NON-PID	25	1	26		
	I		PhD	Non-PhD	Total
	Internation	International members		12	17
Visiting researchers	6				



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	46	17	9	2	-	74
Indexed proceedings 1			Book chapters	International 1	National -	Total 1
Number of citations	1.937					
Publications with international collabo	oration	59%			Editor	Guest Editor
Publications in top 10% prominence percentile		12%	Journals or collection		42	9
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	3,3		0,9	1,3		2,0

2. Books

Туре	International	National	Total
Authoring	-	-	-
Edition	-	-	-
Book of proceedings	-	-	-
Outreach book	-	-	-
Non-indexed book chapters	9	1	10
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	5 4		Journa	ls or collections	Editor 5	Guest editor -
UMinho Repositorium	Open	access documents 71		Total downloads 56.507		
Communications	<i>Internat</i> Oral 73	ional Poster -	۸ Oral 9	lational Poster -		

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	4	311.877€	25.832 €
	Others	7	668.903€	212.610 €
	Total	11	980.780 €	238.442 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	l (National + International)	11	980.780 €	238.442€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	-	-	-
International meetings organization	40		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	5	5

Theses and Dissertations

Theses and dissertations	
PhD theses completed	10
On-going PhD theses	26
Master dissertations completed	84

Major achievements

Flagship publications

Dynamic hospital competition under rationing by waiting times

Journal of Health Economics (2019) 66. 260–282.

The Effects of Electoral Incentives on Fiscal Policy: Evidence from a Legislative Change at the Local Government Level

Journal of Law, Economics, and Organization (2019) 35 (2). 394–421.

Product market competition and gender discrimination

Journal of Economic Behavior and Organization (2019) 157. 496–522.

The parental co-immunization hypothesis: An observational competing risks analysis *Scientific Reports* (2019) 9. 2493.

Procedural Fairness, the Economy, and Support for Political Authorities

Political Psychology (2019) 40 (1). 165–181.

Flagship projects



Voting rules and electoral biases

Quorum requirements in national referenda respond to two concerns: the representativeness of the referendum outcome and the protection of minorities. However, quora change the electorate incentives and cause several distortions, biasing the electoral results. In several lab experiments, we investigate the performances of different quorums.



It's All About Productivity: contributions to the understanding of the sluggish performance of the Portuguese economy

Globalization and the industrial revolution 4.0 pose great challenges to the competitiveness of companies and the sustainable growth of the Portuguese economy. It is intended to characterize the main determinants of productivity, identify structural changes and contribute to the design of public policies that induce productivity gains.



Competition and business model innovation in the digital age: theory and applications

This project investigates the strategic and welfare effects of mass customization, personalized pricing, targeted products and advertising in digital markets. It also focuses on business model innovation within the platform economy and investigates how digital platforms can use data to implement successfully different strategies in competitive markets.

Scientific recognition

The paper "Women on Bank Boards: Evidence from Gender Ouotas Around the World", co-authored by Gilberto Loureiro was distinguished with the "Outstanding Paper in International Finance" award, sponsored by The Southern Finance Association

The study shows that board gender guota laws lead to increased female board representation. There is an increase in risk taking and worse operating performance post quota law for banks located in countries with a smaller pool of qualified women. Results suggest that female labor market constraints drive the risk taking and performance outcomes.



Ricardo Sousa won the 2019 EEG-UMinho Research Award for the paper "Agnel-Io, L., Castro, V., & Sousa, R. M. (2018). The Legacy and the Tyranny of Time: Exit and Re-Entry of Sovereigns to International Capital Markets. Journal of Money, Credit and Banking, 50(8), 1969-1994

We assess the duration of the exit and re-entry of sovereigns to international capital markets using a novel continuous-time Weibull model on a panel of countries over 1970-2011. During short exits, debtors take the "benefit of doubt" from creditors in building reputation. However, when exits are long, no more "complacency" complicates re-entry.



Won the 2019 EEG-UMinho Research Award

Lúcia Lima's paper "Accountability Reporting Objectives of Māori Organizations" published in "Pacific Accounting Review" was highly commended in the Emerald Literati Awards for Excellence

The paper aims to highlight the accountability reporting objectives of four Maori-controlled organizations. Narrative sections of ten annual reports of Maori organizations, from their financial years ending in the calendar years 2009 to 2014, are read closely. The discussion should help inform reporting initiatives of organizations that are seeking better accountability.



Scientific leadership



Francisco Veiga - President of the European Public Choice Society

Founded in 1972, the EPCS aims at promoting scientific research on the economic and interdisciplinary analysis of non-market decision making processes and institutions, and to facilitate the exchange of work and ideas about it. EPCS annual meetings are attended by around 400 researchers. Francisco Veiga is the first Portuguese EPCS president



Odd Straume - Associate Editor of the Journal of Health Economics

The Journal of Health Economics is a peer-reviewed academic journal publishing articles related to the economics of health and medical care. Published by Elsevier since 1982, it is widely recognized as the leading journal in the field of health economics. Odd Rune Straume has been a member of the editorial board since 2019.



Manuel Rocha Armada - President of the European Financial Management Association (EFMA)

To encourage research, worldwide, about financial decision making, European Financial Management Association (EFMA) holds Annual and highly International meetings. Manuel Rocha Armada was the first Portuguese to take the role as its President in 2011 and, again, in 2019. A Nobel Prize was the Guest Speaker in both events.

MECHANICAL ENGINEERING AND RESOURCE SUSTAINABILITY CENTRE

The Mechanical Engineering and Resource Sustainability Centre (MEtRICs) was created in 2013 by joining researchers from the Mechanical Engineering Department at UMinho and the Department of Biomass Sciences and Technologies at the New University of Lisbon. In 2018, a partnership agreement with the Centre for Residue Valorisation – CVR, a non-profit R&D organisation based at UMinho was signed.

The MEtRICs mission is to create scientific knowledge and provide technical solutions for a cleaner, safer and sustainable world. MEtRICs is, at UMinho, the single research centre evaluated within the FCT's Mechanical Engineering panel, ranked in the last 2019 evaluation as Very Good. Although most of the research activities are at the frontier with environment issues, this identification avows Mechanical Engi-

neering to be a core discipline for sustainable development. MEtRICs is part of the School of Engineering at UMinho and, therefore it is a key element of the education offer in graduate and post-graduate training and research provided to the region and the society.

The centre is organized in four research lines: Energy Conversion and Environment; Advanced Engineering Systems; Structures and Vehicle Engineering; Food Technology and Wellbeing.

MEtRICs has been collaborating with various scientific institutions from North and South America, Europe, Asia and North Africa. These extend to projects and advanced training. The extensive collaboration with other national research centres both in the University (ME-MEMS, ALGORITMI, ISISE) and through the Nation: IST, IPB, IPP, FEUP, Centi, INL, should also be mentioned.



Total 4

The centre is an active member in various networks: AEBIOM (European Biomass Association); FP7 technology platform "Renewable Heat and Cooling"; European Pellet Council founding member of WASTE CLUSTER PORTUGAL; platform Shared Waste Solutions (SWS); platform CTS - Centre of Technology and Systems; platform INTEROP-VLAb; DYMAT - European association for the promotion of research into the dynamic behaviour of materials and its applications. The strategy for the centre is based on: a) developing the network of collaborations with international partners; b) fostering the collaboration with industry; c) promoting a balance between fundamental research, applied technologies and dissemination; d) making scholarships available for the PhD programs; e) developing initiatives to promote the dissemination of scientific know how with the industry and community; f) participation in international networks; q) attracting high quality researchers; h) promoting inclusion within the institution.

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🕴 Staff

Total members

	Full m	embers		
PhD	Internal	External	Total	
	16	8	24	
New PhD	PhD students	Others	Total	
Non-PhD	43	12	55	
	International members		PhD 4	Non-PhD -
Visiting researchers	1			
Technical staff	1			
iechnical staff	Ţ			

Director

José Carlos Fernandes Teixeira

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Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	19	21	35	3	2	80
Indexed proceedings 16						
Number of citations	899					
Publications with international collab	oration	23%		urnals or collections	Editor	Guest Editor
Publications in top 10% prominence percentile		7%	500	Journals of collections		1
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	2,9		0,6	0,8		2,0

2. Books

Туре	International
Authoring	-
Edition	-
Book of proceedings	4
Outreach book	-
Non-indexed book chapters	-
Educational book	1

3. Non indexed indicators

Journals	1					
Proceedings	8					
UMinho Repositorium	Оре	en access documents 68		Total downloads 69.724	Others	1
		national	. .	National		
Communications	Oral	Poster	Oral	Poster		
	76	-	-	-		

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	11	2.773.002 €	535.942 €
	Others	-	-	-
	Total	11	2.773.002 €	535.942 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	1	43.968 €	46.949 €
	Total	1	43.968 €	46.949 €
То	tal (National + International)	12	2.816.970 €	582.891€

Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
	National patents	-	-	-
	International patents	2	-	2
	International meetings organization	9		
	Spin-offs and Start-ups with UMinho label	-		
	Others (consultancy, exhibitions, observatories and technical reports)	International	National	Total
		2	-	2

Theses and Dissertations

Theses and dissertations			
PhD theses completed	5		
On-going PhD theses	43		
		In cooperation with international institutions	3
Master dissertations completed	61		

Major achievements

Flagship publications

High-Performance µ-Thermoelectric Device Based on Bi 2 Te 3 /Sb 2 Te 3 p-n Junctions *ACS Applied Materials & Interfaces* (2019) 11 (42). 38946–38954.

Blood Cells Separation and Sorting Techniques of Passive Microfluidic Devices: From Fabrication to Applications

Micromachines (2019) 10. 593.

Upgrading of refuse derived fuel through torrefaction and carbonization: Evaluation of RDF char fuel properties Energy (2019) 181. 66-76.

Positive, zero and negative Poisson's ratio non-stochastic metallic cellular solids: Dependence between static and dynamic mechanical properties

Composite Structures (2019) 226.111239.

Oleaginous yeasts for sustainable lipid production—from biodiesel to surf boards, a wide range of "green" applications Appl Microbiol Biotechnol (2019).

Flagship projects



ThermFire4Woven: Desenvolvimento de estruturas fibrosas avançadas com tratamentos da superfície fibrosa e revestimentos com elevada eficiência térmica e resistência à chama para aplicações de alto valor acrescentado

The project led by the company Olbo & Mehler aims to develop advanced fibrous structures by enhanced surface coatings providing high thermal efficiency and flame resistance for applications in fire curtains and battery support boxes.



GEO-DESIGN: Artefatos para hotelaria e mobiliário urbano incorporando resíduos

The objective of the GEODESIGN project is the development of new materials and new products for urban furniture and architecture incorporating non-hazardous industrial wastes.



NFsCoolingSystem: An advanced microCooling System based on innovative NanoFluids and acoustic streaming

The NFsCooling project aims to develop nanofluids, based on magnetic nanoparticles, applied to advanced microchannel heat transfer systems, integrating piezoelectric elements for their long-term stabilization.

Scientific leadership



Renewable Heat and Cooling - Steering Comittee

The European Platform for Technology and Innovation in Renewable Heating and Cooling, aims to play a decisive role in maximizing synergies and strengthening research, development and technological innovation efforts that will consolidate Europe's leading position in the sector.

ALGORITMI CENTRE

ALGORITMI's origin can be traced back to 1990. A few of researchers in the middle of the 90s, in the North of Portugal, identified the need of further research classes in two main areas: Information Systems and Technologies, Electronics and Systems Engineering.

The ALGORITMI Centre is a research unit of the School of Engineering that develops R&D activity in Information and Communications Technology and Electronics, spreading into six major fields: (1) Computer Science and Technology (CST); (2) Information Systems and Technology (IST); (3) Computer Communications and Pervasive Media (CCPM); (4) Industrial Electronics (IE); (5) Industrial Engineering and Management (IEM); (6) Systems Engineering and Operational Research (SEOR). This centre is a multi-disciplinary research unit, with a heterogeneous international activity, maintaining active exchange programs with universities and research centres all around the world. Nowadays, ALGORITMI is focused in: enhancing its international publications track record; increasing its funding track record; supporting researchers applying for funding and project management; increasing its potential for sustainable development through external funding and/or commercialization of its research outputs; adding value to its overall research strategy; contributing to regional and national economic development and enhancing the quality of the postgraduate offer.

ALGORITMI Centre focuses its activity on projects that explore a strong link with the community, namely, the industry and the public administration. Located in an industrialized region with an important expression on textile and footwear industries and an emerging field on ICT services enterprises, pushed by the e-phenomena age. The automotive industrial field also gained recently an important share of the regional market. Another external factor that influences our target field of application is the growth of the cities in the



region, which introduces several demands for the co-operation of researchers, namely in the field of logistics, communication, e-government, health and resource management. The results of this policy are stated by the number of applied research projects in cooperation with companies at a worldwide level.

In the last few years ALGORTMI researchers have been strongly committed in the partnership between Bosch and Minho's University increasing the strong link with industry. One of the biggest proof of work between this partnership is one of our main projects: "Sensible Car". The main purpose of the R&D Sensible Car project consists in generating advanced knowledge and Technology in the sensors area for driving automation, It will be at the base of innovative solutions at on a world level for the future of mobility car.

In the last evaluation carried out by the National Science Foundation (FCT), ALGORITMI was awarded with the grade of VERY GOOD.

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🕴 Staff

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José Manuel Ferreira Machado

Vice-director

Jorge Miguel Nunes Santos Cabral Maria Sameiro Faria Brandão Soares Carvalho Paulo Alexandre Ribeiro Cortez

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		Full members		Associated members		
	PhD	Internal	External	Total		
		98	3	101	133	
	New DbD	PhD students	Others	Total		
	Non-PhD	133	96	229		
					Non-PhD	Total
		International members		20	69	89
	Visiting researchers	9				



Total members

Technical staff
Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	65	96	104	17	3	285
Indexed proceedings 146			Book chapters	International 14	National -	Total 14
Number of citations	5.428					
Publications with international collab	oration	22%			Editor	Guest Editor
Publications in top 10% prominence percentile		11%		Journals or collections	13	7
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	2,7		0,5	1,0		1,7

Others

9

2. Books

Туре	International
Authoring	-
Edition	-
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	4
Educational book	-

3. Non indexed indicators

Journals	20			
Proceedings	42			
UMinho Repositorium	Оре	en access documents 49		Total downloads 58.929
	International		٨	lational
Communications	Oral	Poster	Oral	Poster
	143	7	43	3

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	21	5.229.561 €	1.245.443 €
	Others	8	919.534 €	140.488 €
	Total	29	6.149.095 €	1.385.931€
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	3	326.449 €	111.241 €
	Others	4	135.889€	25.655 €
	Total	7	462.338 €	136.896 €
Tota	al (National + International)	36	6 611 433 €	1.522.827€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	6		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International -	National -	Total

Theses and Dissertations

Theses and dissertations PhD theses completed	21
On-going PhD theses	149
Master dissertations completed	290

Major achievements

Flagship publications

Placing hubs in CO2 pipelines: An application to industrial CO2 emissions in the Iberian Peninsula Applied Energy (2019) 236. 22–31.

Maximizing the expected number of transplants in kidney exchange programs with branch-and-price Annals of Operations Research (2019) 272 (1-2). 429-444.

Emotions detection on an ambient intelligent system using wearable devices

Future Generation Computer Systems (2019) 92. 479-489.

A Proof of Concept of a Mobile Health Application to Support Professionals in a Portuguese Nursing Home

Sensors (2019) 19 (18). 3951.

Attractor dynamics approach to joint transportation by autonomous robots: theory, implementation and validation on the factory floor

Elsevier Journal, Autonomous Robots (2019) 43 (3). 589-610.

Flagship projects



ESGRIDS - Enhancing Smart GRIDs for Sustainability

The ESGRIDS project aims at developing new scientific methodologies that result in disruptive solutions to meet the challenges that future electrical power systems will face.



TSIM - Test System Intelligent Machines

The project aims is ensure the creation of value in Controlar's products (as the current Bosch supplier) and their adaptation to the reality of Bosch 4.0 Industry and the demands of the automotive sector.



Deus Ex-Machina - Symbiotic Tecnology for Societal Efficiency Gains

The project aims to: Sensing and Acting: creating new detection and sensing mechanisms to access existing devices and develop new sources of detection of the Internet of Things; Investigation of local information fusion algorithms to obtain local information from various detection devices; Implementation of information fusion from multiple distributed devices, historical and contextual data of high level of abstraction in the cloud; ICT4D Network: developing solutions for broadband networks to remote locations in developing countries.

Scientific recognition

1st prize of '2019 International Collegiate Competition for Brain-inspired Computing'

Weronika Wojtak, Flora Ferreira and Paulo Vicente won 1st prize of '2019 International Collegiate Competition for Brain-inspired Computing' with work "Learning sequences with time constraints"



Paulo Novais and Ângelo Costa - CST - won IBM Award of Scientific Excellence

They were awarded for the best practical demonstration at the 17th International Conference on Practical Applications of Agents and Multi-Agent Systems, with the work entitled "EM iR 2.0: A Congnitive Assistant Robot for Elderly".



Best paper for lab Energy and Power Electronics (GEPE)

The paper "A Novel Single-Phase Shunt Active Power Filter Based on a Current-Source Converter with Reduced Dc-link" has received the best paper award at EAI International Conference on Sustainable Energy for Smart Cities, Dec. 2019.



Scientific leadership



Isabel Ramos nominated Chair of Technical Committee 8 - International Federation for Information Processing (IFIP)

TC8 aims to promote and encourage the advancement of research and practice of concepts, methods, techniques and issues related to information systems in organisations.



Pedro Arezes is Associate editor in the journal "Safety Science"

Safety Science serves as an international medium for research in the science and technology of human and industrial safety.



Paulo Sampaio coordinates ranking of the countries with the highest quality

The "World State of Quality" study came as a follow-up to a pilot project developed over three years in the 28 countries of the European Union as a tool to identify areas for improvement, helping governments and organizations to define policies and strategies capable of raising the quality of the countries and, consequently, the well-being of the people.

CENTRE OF TEXTILE AND SCIENCE TECHNOLOGY

The Centre for Textile Science and Technology (2C2T) is a Research Unit established in 1978, working in the area of Fibrous Materials Engineering and Design.

The vision and mission of 2C2T is to be recognized for excellent research in this area, helping society to tackle the biggest and most pressing problems and providing the knowledge base for the continuing viability of the textile value chain for global competition. To accomplish this the Unit defined three strategic goals:

1) Scientific and technological leadership in the field together with a robust interaction research innovation, that will ensure continuing advances and will foster the development of novel materials and technologies, helping the industry to become more competitive, sustainable and improve human condition. 2) Excellent education with a strong research base through the incorporation of innovative attitudes and approaches to provide human resources with the competences needed to address current and future industrial and societal challenges.

3) Strong involvement with industrial partners exploring new opportunities addressed in the National and European strategies to strengthen the national economy and ensure that research outcomes are translated into benefits to society.

Three crosscutting research themes were identified key to generate knowledge and promote innovation to maintain European industrial leadership and economic growth:

a) Nano and Multifunctional Materials;

b) Sustainable and Advanced Processes and Technologies;



c) Design and Product Engineering.

The research activity is organized in the Fibrous Materials Engineering group and the Fibre based Product Design group. The research goal of the Fibrous Materials Engineering group is mainly focused on the development of new materials and processes, including technology and process optimization whereas the group of fibre based Product Design is more orientated to the development of fibre based products, considering the complete Product Life Cycle.

In the 2019 evaluation carried out by the National Science Foundation (FCT), 2C2T was awarded with the grade of Very Good.

Director

Fernando Batista Nunes Ferreira

Vice-director Ana Maria Moreira Ferreira da Rocha

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🕴 Staff

PhD	Internal	External	Total		
	27	3	30		
Non-PhD	PhD students	Others	Total		
Non-Fild	38	6	44		
	International members		PhD 4	Non-PhD 24	Total 28
Visiting researchers	-				
Technical staff	4				



Total members

78

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	18	12	23	-	-	53
Indexed proceedings 18			Book chapters	International 1	National -	Total 1
Number of citations	1.148					
Publications with international collabo	oration	13%			Editor	Guest Editor
Publications in top 10% prominence percentile		7%	Journals or collections		-	1
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	3,6		0,7	0,9		2,6

2. Books

Туре	International
Authoring	2
Edition	-
Book of proceedings	1
Outreach book	1
Non-indexed book chapters	-
Educational book	-

3. Non indexed indicators

Journals	2			
Proceedings	5			
UMinho Repositorium	Open o	access documents 53	7	Total downloads 49.183
Communications	<i>Internati</i> Oral	onal Poster	No Oral	ational Poster
	28	-	-	-

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	23	2.859.085 €	1.397.754 €
	Others	1	5.000 €	608 €
	Total	24	2.864.085 €	1.398.362 €
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
Others		2	92.352 €	1.631 €
	Total	2	92.352€	1.631€
Tota	al (National + International)	26	2.956.437€	1.399.993 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	8	-	8
International patents	-	-	-
International meetings organization	2		
Spin-offs and Start-ups with UMinho label	1		
Others (consultancy, exhibitions, observatories and technical reports)	International -	National -	Total

Theses and Dissertations

Theses and dissertations PhD theses completed	6
On-going PhD theses	33
Master dissertations completed	37

Major achievements

Flagship publications

Multifunctional chitosan/gold nanoparticles coatings for biomedical textiles Nanomaterials (2019) 9 (8). 1064.

Tailoring Bacteria Response by Piezoelectric Stimulation

ACS applied materials & interfaces (2019) 11 (30). 27297-27305.

Surface modification of a polyethersulfone microfiltration membrane with graphene oxide for reactive dyes removal

Applied Surface Science (2019) 486. 499-507.

Chemical characterization and thermal comfort properties of cotton finished with phase change materials and antimicrobial agents

Cellulose Chem. Technol. (2019) 53 (3-4). 363-371.

Mechano-morphological studies of polyamide 6 based single polymer laminate composites prepared by different reactive processing techniques

Polymer Testing (2019) 79. 106017.

Flagship projects



TSSiPRO - Technologies for Sustainable and Smart Innovative Products

Integrated project that will provide cutting edge S&T advancements on sustainable and smart innovative technologies and systems, based on polymers and textiles, integrating embedded electronic systems. Sustainable and Multifunctional Materials, Smart polymers and textiles are the main research lines of the project.



PEPTEX - Electrospun polymeric wound dressings functionalized with Tiger 17 for na improved antimicrobial protection and faster tissue regeneration in pressure ulcers

Generally, pressure ulcer treatments combine antimicrobial topical agents and cover dressings. The objective is to engineer polymeric wound dressings by electrospinning with an "all-in- one" approach, to promote tissue repair, prevent wound chronicity, and protect against microbial colonization. Synthetic and natural polymers will be electrospun in the form of mats and functionalized with antimicrobial peptides (AMPs; i.e. Tiger 17, pexiganan and LL37), endowed with immunoregulatory abilities.

PLASMAMED - Bionanocomposite coatings with controllable antibacterial activity using atmospheric-pressure plasma deposition

The main objective is to produce, by dielectric barrier discharge (DBD) plasma-assisted deposition at atmospheric pressure, a new generation of coatings containing nanoparticles (NPs) and enzybiotics with controllable antibacterial activity on medical textiles with special emphasis in antimicrobial dressing for pressure injury and for hernia meshes. NPs ions release and immobilized enzymes activity will be tune using a "sandwich" polymeric coating structure achieved by aerosol injection where a 1st antibacterial nanocomposite layer is covered by thicker 2nd layer in order to tune antibacterial effect.

Scientific recognition

Andrea Zille - Lead Author of IPCC

Appointed as Lead Author of the Intergovernmental Panel on Climate Change (IPCC) at the Task Force on National Greenhouse Gas Inventories for the textile greenhouse fluorinated gas emissions chapter in the IPCC refinement 2019.



Scientific leadership



Raul Fangueiro - Steering Committee of WANFR

WANFR - World Association of Natural Fibers Research is an association of researchers, technicians, entrepreneurs, institutes (research centers, universities, technological centers), companies and other associations aiming to contribute for the scientific and technical knowledge advance on natural fibers and related areas.

CENTRE OF BIOLOGICAL ENGINEERING

The Centre of Biological Engineering (CEB in a PT acronym) is a Research Unit of UMinho created 25 years ago, being recognized as a National reference Research Unit on Biotechnology and Bioengineering (B&B). Since 2002, CEB was awarded by FCT with the grade of Excellent.

CEB combines key expertise in fundamental science with engineering sciences, covering the molecular, cellular and process scales, to obtain value-added products or processes in the Food, Chemical, Biotech, Biomedical, Environmental and Agricultural sectors. With the motto "Linking life and technology to shape the future", CEB is a unit aiming to be a strategic infrastructure for the development of R&D and innovation policies in 4 interdisciplinary thematic areas.

Industrial B&B - employing microorganisms as biocatalysts and in-

dustrial by-products and wastes as secondary raw materials. Food B&B - enhancing the functionality, quality, safety and nutritional value of food, together with the integration of advanced technologies into food production.

Environmental B&B - remediation of contaminated environments and valorisation of recalcitrant and bio-waste materials by converting them into liquid and gaseous bioenergy carriers, bioelectricity, bulk chemicals or new catalysts.

Health B&B - biofilm science, virulence of pathogenic fungi, bioactive peptides/proteins, biomaterials and polymers for drug delivery and regenerative medicine and systems and synthetic biology approaches. The 2nd level of organisation is implemented through 9 research groups: AMG- Applied Mycology; B.Factory – Molecular Biotechnology,



Bioreactors, Biofuels and Food; BIOFILM Science & Technology; BI-OSYSTEMS - Bioprocess Engineering & Computational Biosystems; BRIDGE - Bioresources, Bioremediation & Biorefinery; BBRG - Bioprocess & Bionanotechnology; FUNCARB-Functional Carbohydrates, FIT – Food Innovation and Technology; and BIOMARK -Biosensors Research.

The CEB research impact into industry, with translation of technology into the market, is also a driving force for CEB researchers and this has been accomplished through R&D projects in industrial consortia and launching of more than 14 spin-offs. Director

Eugénio Campos Ferreira

Vice-director

Miguel Gama Teresa Tavares Nuno Cerca

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Total members 419

17



🛉 Staff



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	225	60	14	-	8	307
Indexed proceedings 4			Book chapters	International 11	National -	Total 11
Number of citations	12.941					
Publications with international collab	oration	57%			Editor	Guest Editor
Publications in top 10% prominence p	ercentile	16%		Journals or collections	-	6
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	6,4		1,3	1,4		4,3

2. Books

Туре	International
Authoring	-
Edition	5
Book of proceedings	3
Outreach book	-
Non-indexed book chapters	1
Educational book	-

3. Non indexed indicators

		en access documei	nts T	Total downloads	
UMinho Repositorium		496		162.789	
	Intern	national	Na	National	
Communications	Oral	Poster	Oral	Poster	
	45 120		15	40	

On-going research projects and funding for the Centre

	National Funding	<i>№</i> of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	53	11.281.771 €	2.592.086 €
	Others	14	510.436 €	107.711 €
	Total	67	11.792.207€	2.699.797€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	9	3.568.935 €	575.592 €
	Others	4	261.206 €	115.279 €
	Total	13	3.830.141 €	690.871€
Tot	al (National + International)	80	15.622.348€	3.390.668 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	1	1
International patents	1	2	3
International meetings organization	3		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	4	4

Theses and Dissertations

Theses and dissertations			
PhD theses completed	21		
		In cooperation with international institutions	4
On-going PhD theses	136		
		In cooperation with international institutions	16
Master dissertations completed	102		

Major achievements

Flagship publications

Community assessment to advance computational prediction of cancer drug combinations in a pharmacogenomic screen Nature Communications (2019) 10 (1). Art. nº 2674.

Dual-drug loaded nanoparticles of Epigallocatechin-3-gallate (EGCG)/Ascorbic acid enhance therapeutic efficacy of EGCG in a APPswe/PS-1dE9 Alzheimer's disease mice model Journal of Controlled Release (2019) 301. 62-75.

Molecularly-imprinted chloramphenicol sensor with laser-induced graphene electrodes

Biosensors and Bioelectronics (2019) 124-125. 167-175.

Anaerobic biological fermentation of urine as a strategy to enhance the performance of a microbial electrolysis cell (MEC)

Renewable Energy (2019) 139. 936-943.

Moderate Electric Fields as a Potential Tool for Sustainable Recovery of Phenolic Compounds from Pinus pinaster Bark

ACS Sustainable Chemistry and Engineering (2019)7 (9). 8816-8826.

Flagship projects



SHIKIFACTORY100 - Modular cell factories for the production of 100 compounds from the shikimate pathway north of Portugal bioeconomy

SHIKIFACTORY100 project aims the production of more than 100 high-added value compounds from the shikimate pathway, through the development of an optimised shikimate chassis for the production of known and newly designed compounds.



YPACK - High Performance Polyhydroxyalkanoates Based Packaging to Minimise Food Waste

YPACK aims to scale up production and validate commercially a fully renewable flow pack film and a fully compostable tray, two innovative food packaging solutions based on polyhydroxyalkanoate (PHA).



MultiBiorefinery - Multi-purpose strategies for broadband agro-forest and fisheries by-products valorisation: a step forward for a truly integrated biorefinery

Project integrating six research units to develop multi-purpose strategies and sustainable innovative technologies for by-products valorization towards a truly integrated biorefinery dealing with multiple feedstocks.

Scientific recognition

Highly Cited Scientist 2019 (Web of Science Group)

CEB hosts three of the world's most influential scientists: José António Teixeira, António Vicente and Miguel Cerqueira.



Nelson Lima - Education and Training in Biotechnology award

Nelson Lima received the Education and Training in Biotechnology award (4th Meeting of Medicinal Biotec.



Artur Cavaco Paulo

Researchers from BBRG leaded by Artur Cavaco-Paulo have modified cotton fabric to emit a lemony citronella aroma upon contact with sweat. Body-odor-fighting strategy highlighted in ACS Applied Materials & Interfaces.



Scientific leadership



Headquarters of pan-European Research Infrastructure

CEB hosts the headquarters of the pan-European Microbial Resource Research Infrastructure - MIRRI, the unique European Research Infrastructure based in Portugal.

CENTRE OF TERRITORY ENVIRONMENT AND CONSTRUCTION

The Centre for Territory, Environment and Construction (CTAC) is a Research Unit of the School of Engineering of UMinho, recognized by the National Science Foundation (FCT), associated to the Department of Civil Engineering (DEC), with whom it shares resources and namely human resources.

Currently CTAC aggregates 37 researchers holding a PhD of which 27 are faculty professors of the Civil Engineering Department.

The general objective of the unit is to produce knowledge to support its vision of "Sustainable and Resilient Cities and Territories", developing innovative materials and technologies and systems in the fields of built environment, systems and infrastructures for transport, water and wastewater and for territory development, contributing to climate-change-resilient buildings and infrastructures, supporting a steady improvement in the quality of life. To fulfil this objective, CTAC combines R&D activities with advanced training, technology transfer, consulting and services, aiming at fostering engineering and construction sectors and environmental entities to support the quality of cities and territories.

CTAC develops fundamental and, mainly, applied and experimental research focused on two interdisciplinary "main research areas of activity": Sustainable Built Environment & Energy Efficiency; Sustainable and Resilient Systems and Infrastructures. CTAC researchers are integrated in five Research Areas of Competence, related with the civil engineering specialisations: Ecomaterials; Sustainable Construction Territorial Planning and Governance; Transport Systems and Infrastructures; Water Resources and Environment; supported by specific laboratories.



CTAC has a dynamic international cooperation through partnerships covering the development of research projects by participating in international research networks, mainly in the fields of sustainable environment and cities as well as in international projects of knowledge transfer, as well as in the Doctoral Programme of Sustainable Built Environment led by CTAC.

The link between research and society constitutes the driving force of intervention of the unit, where, in addition to the contribution for more sustainable built environment, cities and territories, people play the central role, contributing to the improvement of the quality of life. CTAC is also involved in several masters and doctoral programmes, covering the main research fields of the unit, under the leading principle "to teach what is being researched", together with other Research Units, from UMinho and other universities. **Director** Paulo Pereira

Deputy

Manuela Almeida Paulo Ribeiro

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Centre of Territory Environment and Construction

🕴 Staff

		Full m		Associated	
	PhD	Internal	External	Total	
		27	10	37	4
	Non-PhD	PhD students	Others	Total	
	Non-PhD	43	92	135	
	Visiting researchers	10			
	Technical staff	8			
Tot	al members	194			





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	35	14	6	6	-	61
Indexed proceedings 16		Вс	ook chapters	International 1	National -	Total 1
Number of citations	2.056					
Publications with international collabora	tion	42%				
Publications in top 10% prominence per	centile	19%				
			SCOPUS		Clariv	ate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	4,3		0,8	1,3		3,7

2. Books

International
1
-
1
-
8
-

3. Non indexed indicators

Journals		61			
Proceeding	IS	36			
UMinho Re	positorium	C	Dpen access documents 67		Total downloads 69.724
		Inte	ernational	I	National
Communica	ations	Oral	Poster	Oral	Poster
		36	-	8	-

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	6	810.496 €	176.863€
	Others	2	111.000€	8.500 €
	Total	8	921.496 €	185.363€
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	3	517.377€	210.758 €
	Others	1	230.400 €	55.118 €
	Total	4	747.777€	265.876 €
Tota	al (National + International)	12	1.669.273 €	451.239 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	-		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	1	1

Theses and Dissertations

Theses and dissertations PhD theses completed	5
On-going PhD theses	33
Master dissertations completed	18

Major achievements

Flagship publications

Effect of steel fiber and carbon black on the self-sensing ability of concrete cracks under bending

Construction and Building Materials (2019) 20. 630-639.

Hydraulic lime mortars with antifungal properties

Applied Surface Science (2019) 483. 1192-1198.

Urban resilience: A conceptual framework

Sustainable Cities and Society (2019) 50.1 - 11.

SAUS: A tool for preserving urban green areas from air pollution

Urban Forestry & Urban Greening (2019) 46. 126440. 1-12.

Sustainability Strategy in Higher Education Institutions: Lessons learned from a nine-year case study

Journal of Cleaner Production (2019) 222. 300-309.

Flagship projects



Smart cities are walkable: SPN a model to plan a pedestrian network and a pedestrian navigation system - ENSUF/0004/2016

SPN focused on improving walkability in cities: assessing the conditions provided to pedestrians; estimating the cost and benefits resulting of implementing policies to walkability; developing a navigation system to select routes.



Development of a global quality method for the design and evaluation of multifamily residential buildings with social quality, sustainable and energy efficient in the SUDOE territory - ARCAS - E0922

The objective of the ARCAS project is to develop an assessment and design methodology aimed at the renovation of multifamily housing buildings of social interest, to address energy poverty and promote sustainable renovation, energy efficiency and healthy indoor environments.





MarRISK aims the improvement of sustainable management of coastal

zones through the consolidation of knowledge on processes that increase coastal risks, including climate change, and develop innovative adaptation solutions.

Scientific recognition

Highly Cited Scopus Scientist-HCSC

Fernando Pacheco-Torgal - Highly Cited Scopus Scientist-HCSC (2019 Stanford University ranking) https://actu.epfl.ch/news/michael-gratzel-tops-new-ranking-of-scientists/



1 out of 50 examples of employees of the Institution Commission for the Coordination and Regional Development of the North

Júlia Lourenço - Distinction: 1 out of 50 examples of employees of the Institution Commission for the Coordination and Regional Development of the North.



Paper considered by the Chef Editor as one of the three excellent of the year

The paper "A. M. Matos, S. Nunes, J. B. Aguiar, Capillary transport of water in cracked and non-cracked UHPFRC specimens, Journal of Advanced Concrete Technology, Vol. 17, 2019, 244-259. http://hdl.handle.net/1822/60678 doi: 10.3151/jact.17.5.244" was consider by the Chef Editor as one of the three excellent of the year.



Scientific leadership



ICPIC board

José Luís Barroso de Aguiar is a member of the International Congress on Polymers in Concrete (ICPIC) board.

INSTITUTE FOR POLYMERS AND COMPOSITES

IPC is a Research Unit of the Engineering School of UMinho that aims at developing R&D activities in the field of Polymer Science and Engineering. In the 2019 evaluation carried out by the National Science Foundation (FCT), IPC was awarded with the grade of Very Good.

IPC main stated mission is to provide advancements on polymer and composites science and technology for social sustainable development; to generate added value to the polymer, mouldmaking and related industries and, in general, to the society, contributing to the socio-economic growth and to the social wellbeing; and to promote the society awareness of the role and importance of polymeric materials.

IPC is the unique national RU totally devoted to scientific and tech-

nological advancements in polymer and composite science and engineering. In this field, IPC adopts a multidisciplinary approach, covering and integrating the scientific disciplines of polymer chemistry, physics, engineering and technology. IPC develops basic research and integrative applied R&D into applications. IPC targets the promotion of scientific excellence and innovation, developing activities at the international leading edge, fostering breakthrough concepts and their practical exploitation.

IPC envisages contributing to the advancement of scientific knowledge in:

 BASIC KNOWLEDGE R&D AREAS - Advanced materials; Advanced manufacturing technologies; Advanced engineering design.
 INTEGRATIVE R&D AREAS - Integration of advanced materials



Integrative manufacturing; Embedding functions into systems; Immersive engineering.

3. R&D APPLICATIONAL CHALLENGES - Polymers for advanced applications; Circular economy; Digital transformation.

IPC identified 3 main leading themes around which its activities are developed:

- 1. Sustainability and Eco-efficiency;
- 2. Smaller, Stronger, Smarter;
- 3. High-value manufacturing.

Director Júlio César Machado Viana

Vice-director Ana Vera Machado

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Total members

118

🛉 Staff





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	26	15	5	1	1	48
Indexed proceedings 8						
Number of citations	1.664					
Publications with international collabo	ration	30%				
Publications in top 10% prominence pe	ercentile	4%				
		SC	COPUS		Clariv	vate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	4,7		0,8	1,2		3,2

2. Books

Туре	International
Authoring	-
Edition	-
Book of proceedings	1
Outreach book	-
Non-indexed book chapters	-
Educational book	-

3. Non indexed indicators

Journals	-	
Proceedings	54	
	Open access documents	Total downloads
UMinho Repositorium	10	9.957

1

On-going research projects and funding for the Centre

	National Funding N° of on-going projects		Total funding	Funding executed in 2019
	Portugal 2020 Programme	24	8.448.709 €	1.451.426 €
	Others	1	223.950€	41.708 €
	Total	25	8.672.659€	1.493.134€
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	2	379.607€	80.150 €
	Others	2	234.895 €	165.947€
	Total	4	614.502 €	246.097€
Tota	l (National + International)	29	9.287.161 €	1.739.231€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	6	-	6
International patents	-	-	-
International meetings organization	4		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	4	4	8

Theses and Dissertations

Theses and dissertations		
PhD theses completed	-	
On-going PhD theses	7	
		In cooperation with international institutions
Master dissertations completed	20	

Major achievements

Flagship publications

Micromechanical finite element parametric study of polyamide 6 based single polymer composites reinforced by woven textile structures *Composite Structures* (2019) 225. 111088.

Highly Sensitive Piezoresistive Graphene-Based Stretchable Composites for Sensing Applications

ACS Applied Materials and Interfaces (2019) 11 (49). 46286–46295.

Multi-parameter in-process monitoring of clay dispersion during melt compounding with PLA *Express Polymer Letters* (2019) 13 (3). 276-285.

A study on extruded filament bonding in fused filament fabrication

Rapid Prototyping Journal (2019) 25 (3). 555–565.

Effect of combined dilute-alkaline and greenpretreatments on corncob fractionation: Pretreated biomass characterization and regenerated cellulose film production

Industrial Crops and Products (2019) 141. 111785.

Flagship projects



FIBR3D

Additive Manufacturing-based hybrid process for long or continuous fibre reinforced thermoplastic matrix composites.



TOOLING4G - Advanced Tools for Smart Manufacturing

Its purpose is to train companies in the molds and plastics sector, allowing them to create internal knowledge that allows them to compete globally and overcome market challenges.



FAMEST Footwear, Advanced Materials, Equipment's and Software Technologie

New concepts for fashion, technical, customized, intelligent footwear; Innovative bio, eco, nano materials and multifunctional components; Digital technologies for production, value chain and customer; Innovative and environmentally responsible business models.

INSTITUTE FOR SUSTAINABILITY AND INNOVATION IN STRUCTURAL ENGINEERING

ISISE was created in 2007 involving the Civil Engineering Departments from UMinho and University of Coimbra (UC). The objective was to achieve excellence in research and to create a leading cluster in Structural Engineering, with top quality R&D+I and active members. The Unit is based on strong leaderships, with a proven record of internationalization, contracted research, cooperation with industry, top level dissemination in the international arena, PhD students and post-doc collaborators.

ISISE has 60 integrated PhD members (2/3 faculty and 1/3 postdocs) and approximately 120 PhD students, 20 M€ of competitive funding granted (last 5 years), 45 I&D projects in the 2013-2017 period, 4 European Master Courses (3 Erasmus Mundus), 3 PhD Programs and 5 journals as editors and 2 COST Actions. The unit is now organized in 4 Research Groups related to Functional Performance (FP), Historical and Masonry Structures (HMS), Structural Composites (SC), and Steel and Mixed Construction Technologies (SMCT). A Management Board (Directors and Coordinators of each group) manages the unit, with monthly video conferences.

The hosting institutions are well-equipped with complementary laboratory facilities, with a total area about 5000 m².

The Unit aims to increase the structural and have functional performance of Civil Engineering Works, from a perspective of advanced technology and innovation, from Materials to Life Cycle Performance. The approach includes aspects such as advances in experimental and numerical techniques, product development and technology transfer to the industry, durability and reliability, recycle, reuse, conservation



and rehabilitation, condition assessment, and risk assessment. These aims are aligned with visions from the European Construction Technology Platform, the European Steel Technology Platform and Priorities in Horizon 2020 but also current and future demands, including aspects such as digital transformation, circular and blue economies, energy, defence and security, infrastructure management, heritage or active ageing. In short, ISISE aims at promoting innovation and sustainability, with a link to the construction industry and an up to date focus on a swiftly changing world.

The information in the following sections concerns only ISISE at UMinho.

Director Paulo B. Lourenço

Vice-director José Sena-Cruz

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🕴 Staff

	Full members						
	PhD	Internal	External	Total			
		32	2	34			
	Non-PhD	PhD students	Others	Total			
	Non-Fild	59	49	108			
		Internation	al members	PhD 7	Non-PhD 39	Total 46	
	Visiting researchers	15		·			
	Technical staff	8					
Tot	tal members	165					



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	86	14	10	2	6	118
Indexed proceedings 54			Book chapters	International 21	National -	Total 21
Number of citations	3.324					
Publications with international collaboration	ation	50%			Editor	Guest Editor
Publications in top 10% prominence per	centile	18%		Journals or collections	2	3
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	4,2		1,0	1,3		3,1

2. Books

Туре	International	National	Total
Authoring	3	-	3
Edition	-	-	-
Book of proceedings	4	-	4
Outreach book	-	-	-
Non-indexed book chapters	19	1	20
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	17 -			
UMinho Repositorium	Open d	access documents 24		Total downloads 48.537
Communications	<i>Internatio</i> Oral 122	onal Poster -	۸ Oral 23	lational Poster -

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	27	6.192.386 €	1.165.859€
	Others	8	448.084 €	72.415 €
	Total	35	6.640.470 €	1.238.274€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	8	5.535.533 €	1.213.382 €
	Others	3	263.000 €	641 €
	Total	11	5.798.533€	1.214.023€
Tot	al (National + International)	46	12.439.003€	2.452.297€

Scientific dissemination and knowledge transfer

International meetings organization	5		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International 2	National 5	Total 7

Theses and Dissertations

Theses and dissertations			
PhD theses completed	6		
		In cooperation with international institutions	3
On-going PhD theses	58		
		In cooperation with international institutions	13
Master dissertations completed	17		

Major achievements

Flagship publications

Historic Construction and Conservation. Materials, Systems and Damage *Routledge*, ISBN 078-0-367-14574-3.

Comparison of in-plane and out-of-plane failure modes of masonry arch bridges using discontinuum analysis

Engineering Structures (2019) 178. 24–36.

Shear strengthening of masonry wallettes resorting to structural repointing and FRCM composites

Construction and Building Materials (2019) 206 (10). 19-34.

Hygro-mechanical modeling of restrained ring test: COST TU1404 benchmark

Construction and Building Materials (2019) 229 (30). 116543.

A new strengthening technique for increasing the load carrying capacity of rectangular reinforced concrete columns subjected to axial compressive loading

Composites Part B Journal (2019) 158. 67-81.

Flagship projects



STAND4HERITAGE: New STANDards for seismic assessment of built cultural HERITAGE

The ERC grants are the most prestigious in Europe and the project introduces new standards for safeguarding the built cultural heritage, by combining integrated models for the dynamic response and capacity with analytical approaches for seismic assessment.



HeritageCare: Monitoring and preventive conservation of historical and cultural heritage

The HeritageCare project has developed a digital-based integrated methodology to provide enhanced tools and services to document cultural heritage buildings and engage owners in the conservation process of their legacy.



SIRMA: Strengthening Infrastructure Risk Management in the Atlantic

SIRMA project aims to develop a framework for the management and mitigation of extreme natural events, by implementing mitigation measures, therefore increasing the resilience of transportation infrastructure in the Atlantic Area.

Scientific recognition

World Innovation Award in Bridge Engineering

"São Silvestre footbridge: an innovative GFRP-SFRSCC hybrid structural system" developed by the University of Minho (Profs. Joaquim Barros and José Sena Cruz), Instituto Superior Técnico, and Alto - Perfis Pultrudidos (3rd place).



Fellow of the American Concrete Institute (ACI)

Prof. Joaquim Barros has been elected a Fellow of the ACI in recognition of his significant contributions to the work of ACI. Prof. Joaquim Barros is voting member of the ACI-544 and associate member of the ACI-440 technical committees.



"Red Temática Conacyt Prize" for the best research thesis in Historic Centres

Santiago Granda has been awarded for the SAHC master's dissertation under the supervision of Doctor Tiago Ferreira, entitled "Multi-scale fire risk assessment and mitigation in urban areas: The old city centers of Guimarães and Quito as case studies.



Scientific leadership



Editor of Int. J. of Architectural Heritage, Taylor and Francis

Provides a multidisciplinary scientific overview of existing resources and modern technologies useful for the study of monuments and historical construction.



Member of the Scientific Council of IFSTTAR

The IFSTTAR, is a Public Institution of a Scientific and Technical Nature, under the joint supervision of the Ministry for an Ecological and Solidary Transition, and the Ministry of Education, Higher Education, Research and Innovation, France.



Vice-President of IABSE

The International Association for Bridge and Structural Engineering (IABSE) is a scientific / technical Association comprising members in 100 countries and counting 56 National Groups worldwide. Founded in 1929 it has its seat in Zurich, Switzerland.

HIGH-ASSURANCE SOFTWARE LABORATORY

The High-Assurance Software Laboratory (HASLab) was founded in early 2011 by researchers at the Department of Informatics of the School of Engineering, of which it is currently a Research Unit. Briefly after its creation, HASLab joined the Institute for Systems and Computer Engineering - Technology and Science (INESC TEC), an Associated Laboratory with researchers from several higher education institutions in the north of Portugal. UMinho is currently one of the shareholders of INESC TEC, being HASLab the pole of INESC TEC at this university. In the last 2019 evaluation carried out by the National Science Foundation (FCT), INESC TEC was ranked as Very Good. HASLab's mission is focused on the design and implementation of high-assurance software systems: software that is correct by design and resilient to environment faults and malicious attacks. HASLab accomplishes its mission by anchoring its research on a rigorous approach to three areas of computer science:

- Software Engineering, with a focus on the formal design of safety-critical systems, static and dynamic program analysis techniques, and formal methodologies for quantum computing.

- Distributed Systems, namely dependable data management for cloud computing and data science support, dissemination and aggregation protocols for very large geographically distributed systems, and programmable software-defined storage systems.

- Cryptography and Information Security, focusing on provable security and formal verification of cryptographic protocols, efficient and secure implementation of cryptographic software, and privacy-enhancing technologies.



Most HASLab members collaborate regularly with key national and international research Centres and ICT companies. These collaborations occur mainly in the context of European and consultancy projects, that constitute the main revenue sources of the Centre. The strategy for the Centre evolution, in particular to attract top post graduate students, is also anchored in these connections. The Centre is currently focusing on improving its prototype-level software development tools to production-level open-source tools, targeting a significant user-base and high profile applications. These will enable the Centre to consolidate and establish new long term technology transfer collaborations with international giants in ICT, and thus ensure the real-world impact and visibility of its research. **Director** José Nuno Oliveira

Vice-director Manuel Alcino Cunha

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🛉 Staff




Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	2	12	9	-	-	23
Indexed proceedings 31						
Number of citations	637					
Publications with international collab Publications in top 10% prominence		37% 7%	ol	urnals or collections	Editor 1	Guest Editor -
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	2,7		0,5	1,0		1,2

2. Books

Туре	International
Authoring	-
Edition	2
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	3
Educational book	-

3. Non indexed indicators

Journals	2			
Proceedings	-			
UMinho Repositorium	Open	access documents 2		Total downloads 75.556
Communications	<i>Interna</i> Oral	tional Poster	Oral	National Poster
	48	-	-	-

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	13	1.978.217€	1.234.428 €
	Others	7	-	-
	Total	20	1.978.217€	1.234.428 €
	International Funding	N° of on-going projects	Total funding	Funding executed in 2019
	European	4	-	-
	Others	1	-	-
	Total	5	-	-
Tota	II (National + International)	25	1.978.217 €	1.234.428 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	4		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	5	5	10

Theses and Dissertations

Theses and dissertations			
PhD theses completed	1		
On-going PhD theses	20		
	20	In cooperation with international institutions	1
Master dissertations completed	22		

Major achievements

Flagship publications

Verification Templates for the Analysis of User Interface Software Design

IEEE Transactions on Software Engineering (2019) 45 (8). 802-822.

Scalable eventually consistent counters over unreliable networks

Distributed Computing (2019) 32 (5). 69-89.

A Machine-Checked Proof of Security for AWS Key Management Service

Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security (2019). 63-78.

Efficient Synchronization of State-based CRDTs

IEEE 35th International Conference on Data Engineering (2019). 148-159.

GreenHub Farmer: Real-world data for Android Energy Mining

IEEE International Working Conference on Mining Software Repositories (2019). 171–175.

Flagship projects



InterConnect - Interoperable Solutions Connecting Smart Homes, Buildings and Grids

InterConnect is developing solutions for smart homes, building and the smart grid, focusing in the interoperability of IoT digital services, platforms and devices via a SAREF interface, focusing on IoT data process and privacy. This H2020 project ends in 2023.s.



LightKone - Lightweight Computation for Networks at the Edge

The LightKone project aims to develop a scientifically sound and industrially validated model for doing general-purpose computation on edge networks. An edge network consists of a large set of heterogeneous, loosely coupled computing nodes situated at the logical extreme of a network. The LightKone started in 2017 under the H2020 program.



CloudDBAppliance - European Cloud In-Memory Database Appliance with Predictable Performance for Critical Applications

The project aims at producing a European Cloud Database Appliance for providing a Database as a Service able to match the predictable performance, robustness and trustworthiness of on premise architectures such as those based on mainframes. The project started in 2016 under the H2020 program

Scientific recognition

Most influential paper award at the VL/HCC conference

The paper "Automatically Inferring ClassSheet Models from Spreadsheets" published in 2010 and co-written by João Saraiva was awarded the Most Influential Paper Award at the 2019 VL/HCC international conference.



Scientific leadership



Luís Soares Barbosa - Chair of the IFIP Technical Committee 1 - Foundations of Computer Science

The International Federation for Information Processing (IFIP) Technical Committee 1 - Foundations of Computer Science (IFIP TC1), an international committee that aims at the development of the theory and computer science and of its bridges with other domains of knowledge and socially relevant applications.



Rui Oliveira - Director of the Minho Advanced Computing Centre (MACC)

Minho Advanced Computing Centre (MACC) is a national infrastructure supporting Open Science initiatives on advanced computing, data science and visualisation. MACC offers supercomputing and data management services catering to scientific and industrial communities. It will host the EuroHPC JU supercomputer Deucalion.



José Creissac Campos - Steering Committee chair of ACM SIGCHI EICS

The ACM SIGCHI Engineering Interactive Computing Systems (EICS) conference is one of the most relevant international conference devoted to all aspects of engineering usable and effective interactive computing systems.

CENTRE FOR MICROELECTROME-CHANICAL SYSTEMS

CMEMS was established in December 2013 at UMinho and supports a research team with high degree of multidisciplinary members, from different backgrounds (engineering, physics, medical) and from academic and industrial fields. It must be stated that CMEMS members include senior researchers, national and internationally distinguished collaborators, post-doctoral investigators, PhD and Master students, as well industrial partners. The focus is on modelling computation, development and micro/nano fabrication of devices and components for two major domains: industrial applications (automotive, aerospace, energy, textile) and biomedical applications (neuroengineering, microendoscopy, surgery, rehabilitation). The industrial applications are focused on microdevices and components: mechanical, optical, wireless, energy scavenging, for satellites, for navigation, and industrial coatings. The biomedical applications highlight the neuronal electrodes, lab-on-a-chip, endoscopic capsules, implantable devices, smart prostheses, surgical microinstruments, cellular solutions bioinspired and micro/nano functionalization of surfaces. The excellence can only be achieved through international cooperation. In this way, during the period 2013-2018, several partnerships were established with European, American, and Brazilian Universities in the field of micro/nano fabrication and biomedical applications. As can be observed from CMEMS publications authors, a significant number are produced with international investigators (approximately 40%), as well as with industrial partners. Moreover, national and regional key players should also be taken into account.



The vision of the CMEMS can be stated as being that of an interdisciplinary and multidisciplinary Centre of excellence pioneering high international impact research and innovation in the development of smart microsystems and biomedical systems and maintain active exchange programs with universities, research centres and other laboratories around the world in the field of micro-nano fabrication and biomedical applications.

In the 2019 evaluation process carried out by the National Science Foundation (FCT), CMEMS was awarded with the grade of Excellent.

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Director Paulo Mateus Mendes

Vice-director

José Luís de C. M. Alves Nuno Miguel Magalhães Dourado

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🕴 Staff

Total members





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	65	24	10	1	-	100
Indexed proceedings 36			Book chapters	International 6	National -	Total 6
Number of citations	4.328					
Publications with international collabo	oration	47%			Editor	Guest Editor
Publications in top 10% prominence p	ercentile	15%		Journals or collections	-	8
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	5,8		1,0	1,4		3,7

2. Books

Туре	International
Authoring	1
Edition	-
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	1
Educational book	-

3. Non indexed indicators

Journals	28			
Proceedings	22			
UMinho Repositorium		Open access documents 1		Total downloads -
	In	ternational		National
Communications	Oral	Poster	Oral	Poster
	22	12	20	3

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	33	8.349.979 €	2.158.335 €
	Others	-	-	-
	Total	33	8.349.979€	2.158.335€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	3	390.955 €	133.246 €
	Total	3	390.955€	133.246 €
Tota	al (National + International)	36	8.740.934 €	2.291.581€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	1	1	2
International patents	3	-	3
International meetings organization	1		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International -	National -	Total -

Theses and Dissertations

Theses and dissertations			
PhD theses completed	12		
On-going PhD theses	70	In cooperation with international institutions	1
Master dissertations completed	25		

Major achievements

Flagship publications

High Performance µ -Thermoelectric Device based on Bi2Te3/Sb2Te3 p-n Junctions

ACS Applied Materials & Interfaces (2019) 11 (42). 38946–38954.

Photovoltaics, plasmonics, plastic antibodies and electrochromism combined for a novel generation of self-powered and self-signalled electrochemical biomimetic sensors

Biosensors and Bioelectronics (2019) 137. 72-81.

Adaptive feature recombination and recalibration for semantic segmentation with Fully Convolutional Networks

IEEE Transactions on Medical Imaging (2019) 38 (12). 2914-2925.

Distributed Optical Fiber Sensors for PCB-Strain Analysis

IEEE Transactions on Industrial Electronics (2019) 66 (10). 8181–8188.

Nano-scale modification of titanium implant surfaces to enhance osseointegration

Acta Biomaterialia (2019) 94. 112-131.

Flagship projects



MICRO&NANOFABS@PT Infrastructure

The main goals are to share access to micronanofabrication and design tools with the research community and to increase competitiveness in the medical, environmental, energy, automotive fields.



Hybrid Additive Manufacturing for Bio Inspired Components

An additive and hybrid technology for dental components, with application to Peri-implantitis, a main cause of loss of dental implants, or to reduce the level of invasion when inserting dental facets.



IMPHIB- Development of advanced Hybrid Implants

The ImpHib project fits into a logic of development of bio-inspired componentes where different biological inspired solutions are incorporated into human engineered components.

Scientific recognition

National Gastroenterology Award 2019

D. Costa, C. Lima, C. Rolanda et al.,"Performance Clínica de um novo Software para Detetar Automaticamente Angiectasas na Endoscopia por Cápsula", Portuguese Society of Gastroenterology.



Best scientific article in the area of Machines and Mechanisms

F. Marques, F. Isaac, N. Dourado, P. Flores. "An enhanced formulation to model spatial revolute joints with radial and axial clearances". Mechanism and Machine Theory, 2017, 116: 123-144", according to the publisher Elsevier.



1st place in the Junior Robert Frank Award 2019

Ó. Carvalho, S. Madeira. "The influence of a Laser modified Zirconia implant surface on human osteoblasts in vitro behaviour, Annual Congress of the European Division of International Association for Dental Research (IADR).



RESEARCH CENTRE FOR JUSTICE AND GOVERNANCE

The Research Centre for Justice and Governance (JusGov) is the result of a merger of two research centres previously based at UMinho – the Interdisciplinary Research Centre for Human Rights (DH-CII) and the Centre of Studies in European Union Law (CEDU). The merger was commended by the FCT evaluation panel, which gave JusGov an overall quality grade of Very Good in 2019. The Centre continues to conduct research in human rights and EU law, while widening its research spectrum to cover technological innovation and new business models, globalization and sustainable development, criminal law and criminology, court practice and innovative decision-making. JusGov is organised in six research groups related to the fields of EU law (CEDU), human rights (DH), technology (E.Tec), globalisation and democracy (Glob), criminal law and criminology (JusCrim) and judicial decision-making (JusLab). JusGov's main area of activity is Law, but the team and the approach taken are interdisciplinary, with researchers coming also from the fields of Sociology, Psychology, Criminology, and Economics, and with frequent collaborations across disciplinary lines (e.g. with Computer Engineering and Health Sciences). The common thread underlying and providing consistency to the Centre's activities is the focus on the two key vectors of Justice and Governance, which reflect the priority given by all research groups to studies of "law in action" and the common understanding of law as an organising principle of society, both in the public and the private domains. Furthermore, the Centre's cohesion is secured by the simultaneous participation of many of its researchers in two or more research groups and the large number of joint research, dissemination and advanced training activities involving two or more research groups at a time. JusGov is dedicated to advancing research and



scholarship in Law, by pursuing an innovative research programme and by delivering high-quality training for both master and doctoral students.

As part of its mission, JusGov seeks to explore the role of law in meeting contemporary societal challenges such as those identified by the UN 2030 Agenda for Sustainable Development, in particular the promotion of peaceful and inclusive societies for sustainable development, the achievement of gender equality, the provision of access to justice for all and the building of effective, accountable and inclusive institutions at all levels. Drawing on its researchers' expertise and body of research, JusGov aims to provide a platform for research, discussion and dissemination of scholarly work within the field of Law, offering relevant inputs for the academic community, policymakers, industry, the media and the public (at local, national and international level). Director

Patrícia Jerónimo

Vice-director Joana Rita Covelo de Abreu Marco Gonçalves

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🕴 Staff

	Full m	embers	Associated members		
PhD	Internal	External	Total		
	42	27	69	30	
Non-PhD	PhD students	Others	Total		
	45	23	68		
	• • • • •		PhD	Non-PhD	Total
	Internation	International members		20	34
Visiting researchers	3				
Technical staff	1				



Total members

171

Publications

1. Journals and proceedings (SCOPUS)

	Indexed journals (Sci	imago quartile)	Q1 3	Q2 3	Q3 2	Q4 -	Non-rate	d Total 8
	Indexed proceedings	; -						
	Number of ci	tations	57					
	Publications with int Publications in top 1			38% 0%				
					SCOPUS			Clarivate Analytics
	Average impact of put	olications	CiteScore		SJR		SNIP	IF
			1,7		0,6		1,0	1,2
2.6	Books							
	Туре		International	National	Total			
	Authoring		5	19	24			
	Edition		4	8	12			
	Book of proceedings		-	-	-			
	Outreach book		-	-	-			
	Non-indexed book ch Educational book	apters	46 -	-	134 -			
3.1	Non indexed in	dicators						
	Journals Proceedings	54 -		Journals or collec	tions	Editor 3	Guest editor 1	
							Others	29
		Internati	onal	National				
	Communications	Oral	Poster	Oral Pos	ter			
		165	-	104 -				

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	-	-	-
	Others	1	220.201€	47.371 €
	Total	1	220.201 €	47.371€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	1	46.518€	11.085 €
	Others	1	169.222€	65.192 €
	Total	2	215.740 €	76.277€
Tota	l (National + International)	3	435.941€	123.648 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	-	-	-
International meetings organization	19		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	9	24	33

Theses and Dissertations

Theses and dissertations	
PhD theses completed	13
On-going PhD theses	80
Master dissertations completed	74

Major achievements

Flagship publications

E.TEC YEARBOOK Health Law and Technology (2019).

UNIO - EU Law Journal (2019)5.

Corruption: Proceedings of the International Conferences Corrupción Pública y Reforma Penal and Corruption, Democracy and Human Rigths (2019).

Gender Equality: Challenges Old and New (2019).

Flagship projects



Jean Monnet Module eUjust - EU Procedure and credit's claims: approaching electronic solutions under e-Justice paradigm

As ICT solutions are shaping the way the EU is implementing the e-Justice paradigm, eUjust equates how cross-border justice is being eased by ICT solutions while focusing on the best tools to make interactive relations between the ECJ and national courts speedier.



InclusiveCourts - Equality and cultural difference in the practice of Portuguese courts: Challenges and opportunities for an inclusive society

The project aims at a better understanding of the legal challenges raised by cultural diversity in Europe, by looking into the practice of domestic and international courts. It focuses on the way courts deal with concepts such as identity, culture, ethnicity and religion, and on the way they balance equality and respect for cultural difference in a wide range of cases.



C.L.A.S.S.4EU - 4 EU Training Sessions on Family Law Regulations for Cross-border Lawyers and Social Services

It is a two-year EC funded project (2018-2019) designed to deal with the difficulties arising from the regulation of cross-border family lives.

Scientific recognition

Eva Macedo - Teresa Rosmaninho Prize: Human Rigths, Women's Rights, of the Portuguese Association of Women Lawyers (APMJ)

The Teresa Rosmaninho Prize was awarded in 2019 to Eva Macedo for her paper "Penelope's speech: the right to parity governments as a new legal framework for real equality between men and women".



Marisalva Fernandes Fávero - Maiêutica Scientific Output Award

The Maiêutica Institute awarded its Scientific Output Award to Marisalva Fernandes Fávero for her high-quality achievements in the field of sexuality and sexual violence, having published several national and international books and book chapters and dozens of scientific articles.



Jean Monnet Plaque

The Jean Monnet Plaque is awarded by the Education, Audiovisual and Culture Executive Agency and serves primarily as a label signifying quality in European integration studies and represents the achievements of the Jean Monnet project developed by the Centre in this field.



Scientific leadership



Luís Couto Gonçalves - President of the General Assembly of the Portuguese Association of Intellectual Law (APDI)

APDI is a well-recognized Portuguese cultural association which aims at developing the study, teaching and dissemination of Intellectual Law, covering subjects such as Copyright, Industrial Property and the Information Society.



Nuno Pinto Oliveira - Supreme Court of Justice

The Supreme Court of Justice is the highest court of the judicial courts' system in Portugal.



Filipe Venade - Vice-President of the Portuguese Mechanism for Monitoring the Implementation of the UN Convention on the Rights of Persons with Disabilities

Me-CDPD is an independent national institution for monitoring the implementation of the Convention on the Rights of Persons with Disabilities that works with the Portuguese Parliament in matters concerning the rights of persons with disabilities.

LIFE AND HEALTH SCIENCES RESEARCH INSTITUTE

The Life and Health Sciences Research Institute (ICVS) was established in 2003 to develop biomedical research within the School of Medicine of UMinho. Over the last decade, ICVS has developed synergies with several partners with complementary expertise, namely the 3B's Research Group ensuing the establishment of the PT Government ICVS/3B's – Associate Laboratory, and local healthcare providers to launch the Clinical Academic Centre – Braga Association (2CA-Braga) devoted to performing clinical research.

ICVS is a multidisciplinary unit that currently brings together scientists, engineers and clinicians in a unique scientific and technological platform over 6000 m2 benefiting from research expertise in different fields such as bioimaging, cell and molecular biology, deep learning and computer science, electrophysiology, epidemiology and statistics, functional MRI, medical electronics, microbiology ABSL2/3, motor and cognitive animal behaviour, oncobiology and surgical endoscopy. Scientific projects are developed under four Research Domains: Microbiology & Infection, Neurosciences, Population Health and Surgical Sciences.

ICVS develops projects in national and international consortia, providing experience and training to young researchers and welcomes foreign students and researchers, as well as developing initiatives to foster international institutional collaborations, as those recently established with the International Iberian Nanotechnology Laboratory (INL) as well as the Centro de Investigacións Biomédicas (CINBIO). Along with its several Spin-offs, ICVS aims to contribute as a key stakeholder for the upholding of a competitive Cluster in Biomedical



Science, Technology and Healthcare, steered by the School of Medicine. Aligned with this vision, ICVS aspires to boost its complete research pipeline to create scientific knowledge and value, producing Research Outputs that improve Clinical Outcomes. Director Jorge Correia-Pinto, MD, PhD

Deputy Director João Carlos Sousa, PhD

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🛉 Staff

	Full members					
	PhD	Internal	External	Total		
		109	2	111		
	Non-PhD	PhD students	Others	Total		
	NOIPPID	103	49	152		
		International members		PhD 8	Non-PhD 5	Total 13
	Visiting researchers	12				
	Technical staff	25				
To	tal members	300				



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	172	48	36	7	2	265
Indexed proceedings 8			Book chapters	International 5	National -	Total 5
Number of citations	7.549					
Publications with international collabor	ation	56%		Journals or collections	Editor	Guest Editor
Publications in top 10% prominence pe	rcentile	12%		Journals or collections	44	8
			SCOPUS		Clu	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	5,8		1,5	1,2		3,9

2. Non indexed indicators

	UMinho Repositorium	Ομ	oen access documen	ts To	Total downloads	
		94			39.183	
		Inter	rnational	Nat	National	
	Communications	Oral	Poster	Oral	Poster	
		43	59	80	44	

On-going research projects and funding for the Centre

	National Funding	<i>№</i> of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	41	13.432.300€	4.617.697 €
	Others	18	1.175.872 €	314.459 €
	Total	59	14.608.172 €	4.932.156 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	3	597.981 €	68.370 €
	Others	25	3.001.501 €	620.283 €
	Total	28	3.599.482 €	688.653€
То	otal (National + International)	87	18.207.654 €	5.620.809€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	2	2	4
International meetings organization	3		
Spin-offs and Start-ups with UMinho label	4		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	5	6	11

Theses and Dissertations

Theses and dissertations			
PhD theses completed	13		
		In cooperation with international institutions	5
On-going PhD theses	94		
		In cooperation with international institutions	13
Master dissertations completed	18		

Major achievements

Flagship publications

Role of laterodorsal tegmentum projections to nucleus accumbens in reward-related behaviors Nature Communications (2019) 10(1). 4138.

α-Synuclein toxicity in yeast and human cells is caused by cell cycle re-entry and autophagy degradation of ribonucleotide reductase 1 Aging Cell(2019) 18 (4). e12922.

Asymmetrical subcortical plasticity entails cognitive progression in older individuals. Aging Cell (2019) 18 (1). e12857.

Dysregulation of autophagy and stress granule-related proteins in stress-driven Tau pathology.

Cell Death and Differentiation (2019) 26 (8). 1411-1427.

Clinical significance of metabolism-related biomarkers in non-Hodgkin lymphoma - MCT1 as potential target in diffuse large B cell lymphoma. *Cellular Oncology* (2019) 42 (3). 303-318.

Flagship projects



KidneyNav

The KidneyNav project developed a system to perform percutaneous kidney access in an easy and precise way without Human X-Ray exposure. The patent was sold to an international company of endoscopic medical devices: KARL STORZ SE & CO. KG



Determining the Efficacy of NLX-112 in a Mouse Experimental Model of Cerebellar Ataxia

This project aims to test the therapeutic effect of NLX-112, a novel and highly-selective serotonin 1A (5-HT1A) receptor agonist in a mouse model of Spinocerebellar Ataxia type 3.



Baclofen as a potential treatment to promote recovery from spinal cord injury

Traumatic spinal cord injuries (SCI) cause permanent paralysis. To date no therapeutic solution has been found. We will investigate the impact of baclofen administration on the recovery of neurological impairments caused by SCI.

Scientific recognition

L'Oreal Portugal Award for Women in Science 2019

Joana Cabral received the L'Oreal Portugal Award for Women in Science 2019 for her project 'Unifying principles of EEG-fMRI Brain Networks' bridging concepts in physics and neuroscience to study brain signals.



Nature Research Awards for Driving Global Impact 2019 (Runner up)

Luísa Pinto received the Prize attributed by Nature to early career researchers working in Healthcare interventions for the assessment, improvement or promotion of human health.



Research grant from Liga Portuguesa Contra o Cancro

This project intended to study the in vitro biological activity of novel synthesized compounds for triple-negative breast cancer, to study their mechanism of action and in vivo efficacy and safety profile.



Scientific leadership



Board of Directors | BIAL Foundation Nuno Sousa | Board of Directors | BIAL Foundation.



European Behavioural Pharmacology Society Biennial Meeting

ICVS hosted this meeting where 283 researchers from 27 different countries shared their findings and innovative approaches in both basic and clinical behavioural pharmacology and brain circuitry.



6th Annual ISCaM Meeting 2019– Cancer Metabolic Rewiring: Mapping the Road to Clinical Translation

Nuno Sousa | Board of Directors | BIAL Foundation. ICVS in colaboration with CBMA hosted this meeting that tackled the many faces of cancer metabolism, highlighting the recent advances and the road ahead for clinical translation. Counted with about 200 participants from 27 countries.

HEALTH SCIENCES RESEARCH UNIT: NURSING - NUCLEUS UMINHO

The UMinho Nucleus of the Health Sciences Research Unit: Nursing (UICISA: E) is hosted by the School of Nursing of UMinho (ESE-UM). In the 2019 evaluation carried out by the National Science Foundation (FCT), UICISA: E was awarded with the grade of Very Good. The unit has been evaluated and funded by the National Science Foundation (FCT) since 2004, based at the Nursing School of Coim-

bra, and contributes to the mission of the ESE-UM.

The UMinho Nucleus is part of UICISA: E and its mission is to develop Research and Development (R&D) activities at an international and interdisciplinary level to respond to complex problems, in a sustainable and socially responsible way, at the level of health promotion, disease prevention and care for the sick, disabled and end-of-life person.

ESE-UM is a teaching and Research Unit that enjoys scientific autonomy and endeavors to translate, exchange and improve the scientific and technological knowledge produced by developing application solutions and providing community service based on the best evidence available.

Conducting research at the UICISA: E- UMinho Centre is one of its basic objectives, privileging the permanent search for excellence and innovative and differentiating solutions, as well as the search for answers to society's great challenges.

R&D activities are carried out in three research groups: Training of Health Professionals and Health Education; Well-being, Health and Disease; Health Systems and Organisations.

The UMinho Nucleus of UICISA: E maintains the recognized merit



of a continuous cooperation work with about 30 international and national networks: collaboration; international protocol of advanced training; research projects in cooperation.

The R&D activities are based on three fundamental pillars: joint and solidary action of the three research groups; the structuring projects at the core of UICISA: E; sustained development is strengthened by a cross-cutting combination of specific measures and specialised resources and techniques.

Nucleus coordinator

Ana Paula Morais de Carvalho Macedo

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UICISA:E

🛉 Staff

	Full m		
PhD	Internal	External	Total
	14	-	14
Non-PhD	PhD students	Others	Total
Non-Fild	7	2	9
Visiting researchers	-		
Technical staff	2		



Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	4	4	2	0	-	10
Indexed proceedings -		Во	ok chapters	International 5	National -	Total 5
Number of citations	35					
Publications with international collabo	ration	27%				
Publications in top 10% prominence p	ercentile	7%				
		S	COPUS		Clarive	ate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	2,6		0,6	1,0		2,1

2. Books

Туре	International	National	Total
Authoring	-	4	4
Edition	-	2	2
Book of proceedings	-	-	-
Outreach book	-	-	-
Non-indexed book chapters	1	-	1
Educational book	-	1	1

3. Non indexed indicators

UMinho Repositorium	Оре	en access documents 33		Total downloads 20.215	-	Others	1
	Interr	national		National			
Communications	Oral	Poster	Oral	Poster			
	18	24	1	1			

On-going research projects and funding for the Centre

National Funding		№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	171.058€	35.251 €
	Others	1	29.910€	-
	Total	3	200.968 €	35.251€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	II (National + International)	3	200.968€	35.251€

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	1	1
International patents	-	-	-
International meetings organization	-		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	1	-	1

Theses and Dissertations

Theses and dissertations			
PhD theses completed	3		
On-going PhD theses	10		
		In cooperation with international institutions	1
Master dissertations completed	5		

Major achievements

Flagship publications

Professional practices of education/training of nurses in an intensive care unit

Revista Brasileira de Enfermagem (2019) 72 (2). 338 - 345.

Adiposity and attained height in adolescents: a longitudinal analysis from the LabMed Physical Activity Study

Journal of Pediatric Endocrinology and Metabolism (2019) 32 (10). 1131-1137.

Community Intervention & Recovery: Evolution of Quality of Life, Social Support and Needs' Satisfaction of the Person with Mental Illness

Revista Portuguesa de Enfermagem de Saúde Mental, ESPECIAL 7(2019). 81-87.

A Multigroup Analysis of the Effect of Cognitive Appraisal on Nurses' Psychological Distress.

Nursing Research (2019) 68 (3). E1-E11.

Transition to parenthood: consequences on health and well-being. A qualitative study

Enfermería Clínica (2019) 29 (4). 225-233.

Flagship projects



Healthy children 2021

Rafaela Rosário, Cláudia Oliveria, Maria José Silva, Ana Duarte, Luís Lopes, Silvana Martins. Funding: Fundação Calouste Gulbenkian. Objective: To evaluate the effectiveness of a programme promoting healthy lifestyles in terms of emotional, social and cognitive development, eating habits, sleep and physical activity in children aged between 12 and 42 months. Deliverables (final products): 1-Cognitive, social and emotional development in children. The project will contribute to the development of children, particularly in executive functions such as self-regulation, flexibility (creative thinking) and problem solving. 2- Action of healthy behaviours (physical activity, sedentary behaviour, sleep and eating habits). 3- Obtaining a valid intervention programme in the area of promoting healthy lifestyles.



PSYCHOLOGY RESEARCH CENTRE

The Psychology Research Centre (CIPsi) is the Research Unit of the School of Psychology. CIPsi's main objective is the development and dissemination of scientific knowledge in the fields of Basic Psychology and Applied Psychology, covering several specific areas: Human Cognition; Animal Learning and Behaviour; Psychological Neuroscience; Learning, Instruction and Career; Development and Psychopathology; Psychotherapy and Psychopathology; Health, Wellbeing and Performance; Victims, Offenders and Justice System. Founded in 2003, CIPsi currently includes more than 50 junior and senior researchers, in a balanced proportion of faculty and career researchers. On average, per year, CIPsi publishes more than 150 articles in major journals in the area, receives over 2,500 citations, and captures over 4 million euros in research projects and activities of knowledge

transfer. Progressively recognized by different panels as a research centre of excellence, in the last 10 years CIPsi has occupied a prominent place at national and international level. CIPsi aims not only to consolidate the goal of developing and disseminating high quality scientific knowledge, but also to increase interaction with education and society, broadening its social responsibility. With a strong interactive dynamic between research and education, CIPsi integrates students from all academic degrees into its research teams, creating an environment that promotes a research culture. This organisational model has stimulated a large number of research scholarships awarded in competitive national and international grants, holding currently postgraduate students from over 10 countries worldwide. With a strong dynamic between research and society, CIPsi's



organisational structure provides a high-quality research environment, ensures broad support for its multidisciplinary teams and embraces social responsibility by the quality of the knowledge transference into the community. **Director** Bárbara Figueiredo

Vice-director Sónia Gonçalves

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Universidade do Minho Escola de Psicologia CIPsi

🛉 Staff





Total members

278

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	98	51	11	2	-	162
Indexed proceedings -			Book chapters	International 4	National -	Total 4
Number of citations	2630					
Publications with international collabo	ation	49%		Journals or collections	Editor	Guest Editor
Publications in top 10% prominence percentile		8%		Journals of collections		4
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	3,6		1,0	1,2		2,2

2. Books

Туре	International	National	Total
Authoring	-	3	3
Edition	-	-	-
Book of proceedings	-	-	-
Outreach book	-	-	-
Non-indexed book chapters	15	5	20
Educational book	-	1	1

3. Non indexed indicators

Journals	30
Proceedings	4

	UMinho Repositorium	Ор	en access document	rs To	Total downloads	
			51		100.617	
		Inter	national	Na	National	
	Communications	Oral	Poster	Oral	Poster	
		35	28	31	30	

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
Portugal 2020 Programme		16	2.827.476 €	358.631 €
	Others	5	191.000 €	20.815 €
	Total	21	3.018.476 €	379.446 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	1	23.204 €	8.807€
	Others	-	-	-
	Total	1	23.204€	8.807€
То	tal (National + International)	22	3.041.680 €	388.253 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	3	3
International patents	-	-	-
International meetings organization	-		
Spin-offs and Start-ups with UMinho label	1		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	10	10

Theses and Dissertations

Theses and dissertations			
PhD theses completed	16		
		In cooperation with international institutions	6
On-going PhD theses	75		
		In cooperation with international institutions	10
Master dissertations completed	115		

Major achievements

Flagship publications

Dynamic regulation of interregional cortical communication by slow brain oscillations during working memory Nature communications (2019) 10 (1). 1-11.

Child's oxytocin response to mother-child interaction: The contribution of child genetics and maternal behavior

Psychoneuroendocrinology (2019) 102. 79-83.

Weight loss trajectories and psychobehavioral predictors of outcome of primary and reoperative bariatric surgery: a 2-year longitudinal study.

Surgery for Obesity and Related Diseases (2019) 15 (7). 1104–1112.

Spatial location and emotion modulate voice perception

Cognition & Emotion (2019) 33(8). 1577–1586.

Quality of Life One Year After Bariatric Surgery: The Moderator Role of Spirituality

Obesity Surgery (2019) 29(4). 1207-1215.

Flagship projects



AaZ - Read better, learn more

Intervention program with students with reading and writing problems (PI: Professor João Lopes). Funding entity: Teresa and Alexandre Soares dos Santos Education Initiative.



The implicit cognition of interpersonal attraction

PI: Doctor Joana Arantes. Funding entity: Bial. This project aims to: 1) Determine if changes in attention, memory and timing in situations related to fitness constitute a unitary adaption 2) Analyze the influence of female hormones 3) Determine the electrophysiological correlates of attractiveness-related changes 4) Investigate real-world behavior.



Projeto Ser +

Projeto Ser + is a Gulbenkian Academy. Its aim is to promote skills in adolescents, allowing them to develop a healthy life path (PI: Professor Teresa Freire). Funding entity: Fundação Calouste Gulbenkian.

Scientific recognition

Prize Albert Costa to the Best Scientific Publication

Prize Albert Costa to the Best Scientific Publication, promoted by the Spanish Society of Experimental Psychology (SEPEX). The best scientific publication: Comesaña, M., Bertin, P., Oliveira, H. M., Soares, A. P., Hernández-Cabrera, J., & Casalis S. (2018). The impact of cognateness of word bases and suffixes on morpho-orthographic processing: A masked priming study with intermediate and high-proficiency Portuguese-English bilinguals. PLoS ONE, 13(3), e0193480.

PLOS ONE

The impact of cognateness of word bases and suffixes on morpho-orthographic processing: A masked priming study with intermediate and high-proficiency Portuguese-English bilinguals
Monserrat Comesaka''', Pauline Bertin', Helena Oliveira', Ana Paula Soares', Juan Andris Hernández-Cabrerz', Sélverine Casalla'
1 Human Cognition Lab. OfFis, School of Psychology, University of Minha, Bisega, Pinhagel, 2: Cognitives Bioannes and Affectives Sciences Lab. SCALab. Department of Psychology, University of Life, Like. Practice 2: Department of Psychologies and Mithologies (infeatures) Contenses, University of LiLabaret, Ferentle.

Honorable Mention APP to Young Researcher in Psychology

Honorable Mention APP to Young Researcher in Psychology in 2019 (Portuguese Association of Psychology). This prize was awarded to Jennifer Cunha.



Taylor & Francis Emerging Scholar's Program

Taylor & Francis Emerging Scholar's Program; This prize was awarded to João Tiago Oliveira. This program (2500€/year, 3 years) provides support to young, talented scholars who (1) show promise as psychotherapy researchers and significant contributors to the field, and (2) are economically challenged and require financial assistance to attend the international meetings.



Pedro B. Albuquerque

Vice-President of the Portuguese Association of Experimental Psychology. The aim of this assocation is to organize an annual meeting where researchers share their experiences.



Scientific leadership



Ana Daniela Cruzinha

President of the Portuguese Association of Development and Carrer. The aim of this association is to promote study, intervention and strategies to development of careers.



Bárbara Figueiredo

President of the International Marcé Society for Perinatal Mental Health - Portuguese Speaking Group. The aim of this society is to sustain an international perinatal mental health community to promote research and high quality clinical care around the world.

CENTRE OF PLANT FUNCTIONAL BIOLOGY

The Centre of Plant Functional Biology (CBFP) is a permanent organic Research Unit of the School of Sciences of UMinho, and is located in the Gualtar University Campus in Braga, Portugal. The staff of CBFP beneficiates from the National Science Foundation (FCT) through the Pluriannual Financial Support Programme as members of the FCT Research Unit BioISI - Biosystems & Integrative Sciences Institute (rated as Good in the 2019 evaluation carried out by the FCT).

The Centre has two primary missions:

- i) promotion of scientific research in Plant Functional Biology, and;ii) promotion of high standard post-graduated training activities.Specific research interests include:
- i) Developmental Plant Biology: specifically, on floral development

(study of gene regulatory pathways controlling floral development); ii) Plant Stress Biology: abiotic and biotic plant stress responses (study of genes and pathways responsible for stress tolerance); iii) Plant-microbe interactions and their contribution to increase

crop productivity and forests sustainability.

These scientific aims contribute towards the development of a coherent research program in the area of plant biology and biotechnology, also contributing for plant adaptive responses to the new challenges posed by climate change. The Centre maintains collaboration with other members of the Plant Functional Genomics group of BioISI research Centre (FCUL and UTAD), as well as other national and international Research Units, coordinating and participating in national and international projects (ongoing). A high ratio of young



researchers (post-doc, PhD and MSc students) contribute to CBFP outcomes. CBFP members actively participate on the post-graduation studies programmes of UMinho within the field of Plant Biology, namely on the Doctoral Program on Agricultural Production Chains - from fork to farm (AgriChains) and on the MSc Master Course in Plant Molecular Biology, Biotechnology and Bioentrepreneurship. **Director** Teresa Lino Neto

Vice-director Rui Tavares

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🛉 Staff

PhD		Internal	External	Total		
		5	-	5		
Non-F		PhD students	Others	Total		
NOII-F	שווי	9	10	19		
	I	International members		PhD -	Non-PhD 1	Total 1
Visitir	ng researchers	2				
Techn	ical staff	-				



Total members 26
Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	6	-	-	-	-	6
Indexed proceedings -						
Number of citations	149					
Publications with international collabo	ration	50%		ournals or collections	Editor	Guest Editor
Publications in top 10% prominence pe	ercentile	0%	J	ournals or collections	-	1
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	5,6		1,2	1,3		3,3

2. Non indexed indicators

	Oj	pen access documents	Total downloads	
UMinho Repositorium		-	1.117	
	International		National	
Communications	Oral	Poster	Oral	Poster
	6	2	3	4

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	3	414.518 €	93.690 €
	Others	3	315.856 €	78.110 €
	Total	6	730.374 €	171.800 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
То	tal (National + International)	6	730.374 €	171.800 €

\leftrightarrows Scientific dissemination and knowledge transfer

		Submitted	Granted	Total
National par Internationa		-	-	-
	l meetings organization	1		
Spin-offs an	d Start-ups with UMinho label	-		
Others (con and technic	sultancy, exhibitions, observatories al reports)	International -	National	Total

Theses and Dissertations

Theses and dissertations	
PhD theses completed	1
On-going PhD theses	8
Master dissertations completed	2

Major achievements

Flagship publications

Vitis flower types: from the wild to crop plants *PeerJ* (2019) 7. e7879.

Bacterial disease induced changes in fungal communities of olive tree twigs depend on host genotype

Scientific Reports (2019) 9. 5882.

Climatic impacts on the bacterial community profiles of cork oak soils Applied Soil Ecology (2019) 143. 89-97.

Evaluating stress responses in cowpea under drought stress

Journal of Plant Physiology (2019) 241. 153001.

Evolutionary conservation of the orchid MYB transcription factors DIV, RAD and DRIF

Frontiers in Plant Science (2019) 10. 1359.

Flagship projects



FlowerCAST- Characterization of genetic and environmental determinants involved in reproductive development of Castanea sativa

Characterise the molecular mechanisms important for the reproductive success of Castanea sativa (an important forest species due to its nutritious fruits) and understand how they are affected by climatic conditions.



SuberControl - Influence of endosphere microbiome to control diseases in cork oak (Quercus suber L.)

Climate change may affect future cork oak productivity, but the effect will be enhanced by the presence of opportunistic endophytes (EF) that take advantage of weakened trees. The aim of this project is to identify cork oak EFs that can play an effective role on forest sustainability and study EF microbiome impact on forest health.



CENTRE OF MOLECULAR AND ENVIRONMENTAL BIOLOGY

The Centre of Molecular and Environmental Biology (CBMA) is a R&D Unit created in 2008. In the 2019 evaluation carried out by the National Science Foundation (FCT), CBMA was awarded with the grade of Very Good.

The mission of CBMA is to promote high quality Research and Advanced Education & Training in Biological Sciences, for the benefit of the societal issues of Biosustainability, while serving the community via extension activities that support the development of Science and Technology at the regional, national and international levels.

The CBMA strategic framework is based on three pillars: RE-SEARCH, ADVANCED TRAINING, and SOCIETY, which are rooted in our mission to address the 2030 UN Agenda for Sustainable

Development. These pillars converge to protect natural life and the environment, while promoting human well-being and the preservation of the natural legacy for future generations. CBMA researchers use hypothesis-driven and high-throughput technologies to generate new knowledge, to:

1. Develop environmental monitoring and management tools to protect biodiversity and ecosystem services by i) applying 2nd generation biomonitoring systems based on cutting-edge DNA-sequencing and computational analysis, ii) developing statistical and computational tools to determine the risks, uncertainties and trends for the provision of ecosystem services derived from global climate change, and iii) developing theoretical and computational models for sustainable ecosystems.



2. develop bio-based products and processes to minimise environmental impact by i) identifying molecular targets relevant for biotechnology, ii) screening microbial collections to identify molecular basis of desirable phenotypes for the production of value added compounds, and iii) developing bio-inspired systems to create innovative products contributing to bioeconomy. **Director** Fernanda Cássio

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🛉 Staff

Total members

245





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	73	8	3	3	2	89
Indexed proceedings -			Book chapters	International 1	National -	Total 1
Number of citations	4.417					
Publications with international collabora	ition	41%		Journals or collections	Editor	Guest Editor
Publications in top 10% prominence per	centile	9%		Journals or collections	11	3
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	6,6		1,5	1,4		4,6

2. Non indexed indicators

Journals	2			
Proceedings	-			
UMinho Repositorium	Open d	access documents 22	То	tal downloads 54.755
	Internatio	onal	Nat	tional
Communications	Oral	Poster	Oral	Poster
	45	48	12	51

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	24	4.024.402 €	855.553€
	Others	6	457.945 €	59.061 €
	Total	30	4.482.347€	914.614 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	3	869.683€	140.033 €
	Others	3	428.225 €	113.853€
	Total	6	1.297.908 €	253.886€
Tot	al (National + International)	36	5.780.255€	1.168.500 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	1	-	1
International patents	-	1	1
International meetings organization	10		
Spin-offs and Start-ups with UMinho label	1		
Others (consultancy, exhibitions, observatories	s International	National	Total
and technical reports)	-	1	1

Theses and Dissertations

Theses and dissertations			
PhD theses completed	8		
		In cooperation with international institutions	3
On-going PhD theses	66		
		In cooperation with international institutions	10
Master dissertations completed	61		

Major achievements

Flagship publications

Development of bio-hybrid piezoresistive nanocomposites using silk-elastin protein copolymers *Composites Science and Technology* (2019) 172. 134-142.

Proteomics and antioxidant enzymes reveal different mechanisms of toxicity induced by ionic and nanoparticulate silver in bacteria

Environmental Science: Nano (2019) 6. 1207-1218.

Reward and punishment in climate change dilemmas

Scientific Reports (2019) 9. 16193.

Persistence of phylogeographic footprints helps to understand cryptic diversity detected in two marine amphipods widespread in the Mediterranean basin. Molecular Phylogenetics and Evolution Molecular Phylogenetics and Evolution (2019) 132. 53-66.

Microbiota fingerprints within the oral cavity of cetaceans as indicators for population biomonitoring Scientific reports (2019) 9. 13679.

Flagship projects



EcoAgriFood

EcoAgriFood aims at producing Innovative Green Products and Processes to Promote Agri-Food Bioeconomy in the North of Portugal.



NEXT-SEA

NEXT-SEA aims at appying next generation monitoring of coastal ecosystems in a scenario of global change.



EthnoHERBS

EthnoHERBS aims at Conservation of European Biodiversity through Exploitation of Traditional Herbal Knowledge for the Development of Innovative Products. Marie Skłodowska Curie Research and Innovation Staff Exchange. H2020-MSCA-RISE-2018- 823973.

Scientific recognition

Santos F.P. Best PhD thesis in Artificial Intelligence by the Portuguese Association for Artificial Intelligence

Santos FP. (Pacheco JM (Supervisor) with Santos FC.) Best PhD thesis in Artificial Intelligence by the Portuguese Association for Artificial Intelligence.



Honorable Mention in the 1st edition of the contest "Comunicação de ciência em microbiologia"

Graça D, Fernandes I, Pascoal C and Cássio F. Os fungos aquáticos e as alterações climáticas. Honorable Mention in the 1st edition of the contest "Comunicação de ciência em microbiologia" promoted by the Portuguese Microbiology Society in the category "Público em geral".



CENTRE OF EARTH SCIENCES

The Institute of Earth Sciences (ICT) is a Research Unit established in 2014 with poles in three Portuguese universities: Minho, Évora and Porto. ICT is the largest inter-institutional research structure in Portugal dedicated to geosciences. In the 2019 evaluation carried out by the National Science Foundation (FCT), ICT was awarded with the grade of Very Good. The Centre of Earth Sciences (CCT) is a research sub-unit of the School of Sciences and is the pole of this Institute at UMinho.

The main ICT aims are:

1. To contribute for the development of scientific research and national scientific policies in the earth sciences domain;

2. To cooperate with other institutions through scientific exchanges and to publicise the results obtained by the research and by the technological development; 3. To develop training of young researchers at the post-graduation level;

4. To promote scientific and technological literacy to students and general public.

There are six ICT research groups dedicated to the following topics:

• Atmospheric Sciences, Water and Climate involving the aerial and superficial cycles of the planetary fluids, aerosols including dust and pollens, water resources quality;

• Energy, namely the solar resource, its forecast and use for heat and electricity generation and energy storage (energy sustainability, decarbonisation, and reduction of greenhouse gases);

• Georesources and Geomaterials, with focus on deposits of rare elements, industrial minerals and ornamental rocks; characterization of materials in the scope of geoarchaeological and architectural and



civil engineering purposes and of soils for forensic uses;

• Geoconservation and Geoscience Education with emphasis on geological heritage and its use for science and society in general, including UNESCO Global Geoparks and World Heritage, and also on the development of the geoscientific literacy and awareness for the importance of geosciences in a sustainable planet;

• Environmental Monitoring and Remediation for Sustainability with focus on water, sediments, soils, ecosystems and vulnerable coastal zones considered under the perspectives of environmental monitoring, conservation and rehabilitation;

• Lithosphere Dynamics comprising structural mapping, stratigraphy, geochemistry and geochronology, combined with seismic, geoelectric, magnetic, gravimetric and high-precision down hole temperature studies to infer the complex structure of the lithosphere.

Director

José Brilha

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Instituto de Ciências da Terra Institute of Earth Sciences

🛉 Staff





Total members 53

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	5	5	1	0	1	12
Indexed proceedings 6						
Number of citations	564					
Publications with international collab	ooration	42%				
Publications in top 10% prominence	percentile	16%				
		S	COPUS		Cla	rivate Analytics
Average impact of publications	CiteScore		SJR	SNIF	0	IF
	3,4		0,7	1,1		3,5

2. Books

Туре	International	National	Total
Authoring	-	-	-
Edition	-	-	-
Book of proceedings	-	-	-
Outreach book	-	-	-
Non-indexed book chapters	1	2	3
Educational book	-	-	-

3. Non indexed indicators

Journals Proceedings	2 3			
UMinho Repositorium	Open	access documents 23		Total downloads 9.976
Communications	<i>Interna</i> Oral 40	tional Poster 6	/ Oral 18	National Poster -

3

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	2	242.508 €	21.514 €
	Others	-	-	-
	Total	-	242.508 €	21.514 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	-	-	-
	Total	-	-	-
Tota	al (National + International)	2	242.508€	21.514 €

Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	- 1	- 1
International meetings organization	-	-	1
Spin-offs and Start-ups with UMinho label	2		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	1	2	3

Theses and Dissertations

Theses and dissertations			
PhD theses completed	2		
On-going PhD theses	12		
		In cooperation with international institutions	
Master dissertations completed	6		

Major achievements

Flagship publications

Metalliferous Mine Dust: Human Health Impacts and the Potential Determinants of Disease in Mining Communities Current Pollution Reports (2019) 5. 67–83.

To advance sustainable stewardship, we must document not only biodiversity but geodiversity

Proceedings of the National Academy of Sciences (2019) 116 (33). 16155-16158.

Links between cognitive status and trace element levels in hair for an environmentally exposed population: A case study in the surroundings of the estarreja industrial area Public Health (2019) 16 (22). 4560.

Mechanisms and age estimates of continental-scale endorheic to exorheic drainage transition: Douro River, Western Iberia Global and Planetary Change (2019) 181.

Geoconservation in Chile: State of the Art and Analysis

Geoheritage (2019) 11(3). 793-807.

Flagship projects



NANO-MINENV - Minerals of Environmental Relevance in Acid Mine Drainage Contaminated Systems: Properties and Reactivity at the Nanoscale

The project focuses on one of the world's most serious environmental problems, known as acid mine drainage, which is a process associated with the exploitation of metals. The general idea is the characterization of the natural nanoparticles that result from this process, since they contribute to mobilization of toxic elements.

Scientific recognition

Award for Outstanding Publication

Given by the Association of Earth Science Editors to the book: "Geoheritage: assessment, protection and management", Reynard E. & Brilha J., Eds., Elsevier, https://doi.org/10.1016/C2015-0-04543-9.



Teresa Valente

Invited delegate of the International Atomic Energy Agency for the preparation of guidelines related to the use of hydrological, geochemical, and isotopic tools in mining operations.



Scientific leadership



Paulo Pereira

Focal point in Portugal of The European Association for the Conservation of Geological Heritage – ProGEO

CENTRE OF PHYSICS

The Physics Centre of UMinho (CFUM) is a Research Unit with a multi-disciplinary scientific activity in the fields of Pure and Applied Physics and adjacent areas. CFUM was founded in 1994 and recognized and funded by the National Science Foundation (FCT) since 2004 in the framework of Plurianual or Strategic projects. Since 2014, CFUM is part of the Centre of Physics of Minho and Porto Universities (CF-UM-UP). In the 2019 evaluation carried out by FCT, CF-UM-UP was awarded with the grade of Very Good.

In 2019, CFUM included 69 effective members (most of teaching staff of the UMinho's School of Sciences and full-time researchers with contracts), 11 Post-Docs supported by research fellowships and almost 60 PhD students (some of them shared with other research Centres), as well as a number of research students without PhD. Both

the number of publications and the average journal impact factor increased considerably (by \approx 20%) compared with the previous year. CFUM is strongly involved in interdisciplinary R&D activities and the team includes Physicists, Materials Scientists, Applied Mathematicians, and specialists in Optics and Optometry. The research is carried out in the fields of Condensed Matter and Materials Physics (both theoretical and experimental), Materials Fabrication and Applications, Optics, Advanced Computations, Biophysics, Optometry and Vision Sciences, with approximately 10-15% of theoretical research and modelling and the reminder representing experimental R&D activities. Experimental facilities are organized in 30 research laboratories and include setups and equipment for thin film growth and characterization, optical spectroscopy in different spectral



regions, with time resolved and Raman scattering techniques, dielectric electrical and thermal properties of materials, and optometry and colour vision.

The strategic research Lines are:

(i) Assessment and enhancing visual performance.

(ii) Physics of quantum materials and bionanostructures.

(iii) Functional and smart materials and surfaces for advanced applications.

Development of the Centre is envisaged through further strengthening of research themes within these lines, where international recognition has been achieved. The participation in the UM-Bosch "Sensible Car" megaproject stimulated activity in applied optics and sensing, which now involve more researchers and students. Also, increased development activity is strategic for the Centre and already yielded three recently formed spin-off ventures.

CF-UM-UP

🕴 Staff



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Mikhail Vasilevskiy

Vice-director

Luis Rebouta

Centro de Física

4710-057 Braga

Campus de Gualtar

Universidade do Minho



Total members

200

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	120	47	5	1	3	176
Indexed proceedings 17			Book chapters	International 1	National -	Total 1
Number of citations	9.567					
Publications with international collabo	oration	67%			Editor	Guest Editor
Publications in top 10% prominence p	ercentile	11%		Journals or collections	11	4
			SCOPUS		Cla	arivate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	6,1		1,2	1,2		4,3

2. Books

Туре	International
Authoring	-
Edition	2
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	11
Educational book	-

3. Non indexed indicators

		Ομ	pen access documen	ts 7	Total downloads	
UMinho I	UMinho Repositorium		66		58.029	
		Inter	rnational	Na	ational	
	Communications	Oral	Poster	Oral	Poster	
		104	-	36	-	

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	37	5.666.593 €	1.206.514€
	Others	5	405.996 €	92.048 €
	Total	42	6.072.589€	1.298.562 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	3	529.991 €	86.102 €
	Others	6	164.643 €	62.584€
	Total	9	694.634€	148.686 €
То	tal (National + International)	51	6.767.223 €	1.447.248 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	1	-	1
International patents	1	-	1
International meetings organization	12		
Spin-offs and Start-ups with UMinho label	3		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	-	1	1

Theses and Dissertations

Theses and dissertations			
PhD theses completed	10		
		In cooperation with international institutions	5
On-going PhD theses	57		
		In cooperation with international institutions	36
Master dissertations completed	41		

Major achievements

Flagship publications

Topological strong field physics on sub-laser cycle time scale *Nature Photonics* (2019) 13. 849-854.

High-Performance Ferroelectric-Dielectric Multilayered Thin Films for Energy Storage Capacitors *Advanced Functional Materials* (2019) 29. 1807196.

Hybrid plasmon-magnon polaritons in graphene-antiferromagnet heterostructures 2D Materials (2019) 6. 035105

Surface Plasmon Resonance in a Metallic Nanoparticle Embedded in a Semiconductor Matrix: Exciton-Plasmon Coupling

ACS Photonics (2019) 6. 204–210.

Hyperspectral environmental illumination maps: Characterizing directional spectral variation in natural environments

Optics Express (2019) 27. 32277 - 32293.

Flagship projects



EC Flagship Project: Graphene Core2 - "Graphene-based revolutions in ICT and beyond", UM responsible: Nuno Peres

The Graphene Flagship, now in its 3-rd stage, relies on the intellectual value chain from fundamental to applied and industrial research involving graphene physics, materials science and applications.



PTDC/BTM-MAT/28237/2017: MusclEng - Development of advanced strategies and solutions for muscle tissue engineering based on electromechanical microenvironments, PI Clarisse Ribeiro

MusclEng aims at the development of 3D injectable supports based on piezoelectric fibers to study the electro-mechanical stimulation effect on cell response during muscle differentiation for tissue engineering.



PTDC/FIS-MAC/32299/2017: NAN04BIO - Plasmonic nanoparticles for bio-detection, PI: Filipe Vaz

NANO4BIO is a multidisciplinary project at the frontier between physics and biochemistry, which aims at the development of an optical system for the detection of low concentrations of biomolecules.

Scientific recognition

Winner of the Portuguese Final of Biobased Innovation Student Competition (BISC)

Entrepreneurship project SciAlgae, Ecofriendly and Natural Cosmetics, supervised by M. Lúcio. Portuguese representative in BISC European finals in Berlin, Germany, October 2019.



Innovation Award by i3S-Hovione and Sciencepreneurs Prize by INL, CeNTI and IPN

SPM Nanosolutions is a R&D spin-off that develops magnetic nanosystems for environment (Mag2Clean) and health (NBiON). It involves CFUM researchers E. Castanheira, P. Coutinho, A. R. Rodrigues and PhD students.



Scientific leadership



Presidency of the Ibero-American Optics Network, RIAO

M. F. Costa, researcher at the Centre of Physics, is the President of the Ibero-American Optics Network, RIAO, for 2019-22.



Group on Electrodynamics of 2D Materials at INL

The Research Group on Electrodynamics of 2D Materials at the International Iberian Nanotechnology Laboratory is entirely composed by members of the Centre of Physics (Group Leader Nuno Peres).

CENTRE OF MATHEMATICS

CMAT is a Research Unit of the School of Sciences of UMinho with a pole at the University of Trás-os-Montes e Alto Douro (UTAD). CMAT has belonged to the National Scientific and Technological System of Research Units since 1991. In the 2019 evaluation carried out by the National Science Foundation (FCT), CMAT was awarded with the grade of Very Good.

The Partnership with UTAD started in 2015 and is unique in the context of Portuguese Mathematics Centres. In addition to the strengthening and territorial densification of the scientific national system, it puts CMAT in a competitive position, being the only Math Unit to the north of Porto.

CMAT has 51 integrated members, 13 PhD students and 14 collaborators. The Unit is structured in 4 research groups: Algebra, Logic and Computation; Analysis and Applications; Geometry, Topology and Applications; Statistics, Applied Probability and Operational Research.

CMAT aims to develop and promote its scientific activity both in fundamental and applied Mathematics, seeks to stimulate the application of Mathematics in other disciplines and to contribute to regional and national development. CMAT has solid national and international collaborations with Math Centres in prestigious institutions (e.g. CNRS, Berkeley, Oxford and Sorbonne Univs.) and with several Research Units mainly in the areas of Computer Science, Physics, Engineering, Health and Environment Sciences, strengthening the transfer of knowledge with services and industry and the interaction with the society.



CMAT is strongly committed to implementing several strategies with a view to increasing its overall performance. CMAT intends to reinforce national and international collaborations, disseminate ongoing research and interact with a wider international community, increase the impact of its research, and enlarge advanced training of students. Concretely, CMAT intends to support longterm visits, host prestigious conferences, increase the participation in international events and committees and award initiation, PhD and postdoc grants.

CMAT is also strongly involved in outreach activities oriented to young students, school teachers and the public in general.

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Director Lisa Santos

Vice-director Ana Jacinta Soares

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🕴 Staff

Total members





Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	23	17	16	2	0	58
Indexed proceedings 11		Вос	k chapters	International 1	National -	Total 1
Number of citations 6	88					
Publications with international collaboration		41%				
Publications in top 10% prominence percent	ile	13%				
		S	COPUS		Clarivo	nte Analytics
Average impact of publications Cit	eScore		SJR	SNIP		IF
	2,5		0,7	1,0		1,7

2. Books

Туре	International
Authoring	-
Edition	1
Book of proceedings	1
Outreach book	-
Non-indexed book chapters	-
Educational book	-

3. Non indexed indicators

Journals	18		lourn	als or collections	Editor	Guest editor
Proceedings	30				1	-
UMinho Repositorium	Open	access documents 40		Total downloads 9.206		
Communications	<i>Interna</i> Oral 57	tional Poster 19	Oral 20	National Poster 6		

1

On-going research projects and funding for the Centre

	National Funding	№ of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	5	672.138€	56.081 €
	Others	1	21.949€	1.133 €
	Total	6	694.087 €	57.214 €
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	1	-	-
	Others	1	-	-
	Total	2	-	-
Tota	al (National + International)	8	694.087€	57.214 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents International patents	-	-	-
International meetings organization	11		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International -	National -	Total

Theses and Dissertations

Theses and dissertations		
PhD theses completed	-	
On-going PhD theses	13	
		In cooperation with international institutions
Master dissertations completed	10	

Major achievements

Flagship publications

Sobolev homeomorphisms are dense in volume preserving automorphisms

Journal of Functional Analysis (2019) 276 (10). 3261-3274.

From the simple reacting sphere kinetic model to the reaction-di usion system of Maxwell-Stefan type

Communications in Mathematical Sciences (2019) 17 (2). 507-538.

Existence of positive periodic solutions for scalar delay differential equations with and without impulses

Journal of Dynamics and Differential Equations (2019) 31 (3). 1223–1245.

A generalized Phan-Thien-Tanner model

Journal of Non-Newtonian Fluid Mechanics (2019) 269. 88-99.

Flagship projects



COST ACTION EUTYPES CA15123

CMAT represents Portugal in the action's management committee. EUTYPES involves 28 European countries, and gathers logicians and computer scientists working on type theory and its applications in computer science and mathematics.



NEUROFIELD Analysis and numerical simulation of deterministic and stochastic neural field equations with applications to robotics

The main goals of the project are: i) to apply advanced mathematical tools to develop and analyze dynamic field models of higher-cognitive functions, and ii) to test these neuro-inspired models in real-world human-robot interactions.

Scientific recognition

Third Prize of the 2019 International Collegiate Competition for Brain-inspired Computing at Tsinghua University, China

W.Wojtak, F. Ferreira and P.Vicente, won the third prize of a competition that hosted about 200 teams, with innovative research on brain-in-spired "Learning of sequences with time constraint" with applications in robotics.



CENTRE OF CHEMISTRY OF THE UNIVERSITY OF MINHO

The Centre of Chemistry of UMinho (CQ-UM) is a Research Unit committed to creating knowledge in the forefront of basic and applied chemistry with value to society and oriented to participation in R&D projects in collaboration with external research Centres and industry, in boundary areas of chemistry with biology, medicine, physics, materials science and nanotechnology.

The 31 integrated researchers (25 permanent staff and 6 postdoc integrated researchers) and around 35 collaborators (including PhD students) in collaboration with external R&D institutions, are organized into three lines of research: Applied Biomolecular Chemistry (ABC, 10 researchers), Heterocycles for Societal Challenges (HSC, 8 researchers) and Sustainable Chemistry: New Methods and Materials (SC, 13 researchers). ABC researchers are actively involved in a variety of projects that are linked by the use of biomolecules as targets or as tools for novel applications in drug-delivery systems, bioimaging, antimicrobial/antiproliferative agents and agrochemicals. HSC researchers have expertise in synthetic organic chemistry, especially N- and S-based heterocycles and carbohydrate mimics, tailored to meet the societal needs in terms of new drug candidates (viral and bacterial infections, cancer, diabetes or Alzheimer) or new materials (biomedical and optoelectronic applications). SC research is focused on the development and application of materials for electrochemical cells, optical/electronic devices, films/coatings, zeolites, rehabilitation of contaminated water, biomass valorization and new analytical methods.



In the 2019 evaluation by National Science Foundation (FCT) CQ-UM was ranked as Good. The recent admission of junior researchers, contracted under the FCT program and by financed R&D projects, is expected to dreate a new dynamism to expand and renew research capacity, increase and diversify funding, enhance postgraduate and postdoctoral training, consolidate interdisciplinary thematic areas of research, where Chemistry has an evident and profound importance. **Director** Carlos Jorge Ribeiro Silva

Vice-director Susana Paula Graça Costa

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🛉 Staff





Total members

92

Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	36	8	5	1	3	53
Indexed proceedings 2		Вос	ok chapters	International 3	National -	Total 3
Number of citations	2.288					
Publications with international collabo	ration	64%				
Publications in top 10% prominence pe	rcentile	6%				
		S	COPUS		Clariv	ate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	5,8		1,2	1,2		4,5

2. Books

Туре	National
Authoring	1
Edition	-
Book of proceedings	-
Outreach book	-
Non-indexed book chapters	-
Educational book	-

3. Non indexed indicators

Journals	3			
Proceedings	-			
UMinho Repositorium	Oŗ	pen access documents 14		Total downloads 12.984
		rnational		lational
Communications	Oral	Poster	Oral	Poster
	20	33	8	29

On-going research projects and funding for the Centre

	National Funding	N° of on-going projects	Total funding	Funding executed in 2019
	Portugal 2020 Programme	9	881.537€	257.693 €
	Others	2	190.372 €	47.680 €
	Total	11	1.071.909€	305.373€
	International Funding	№ of on-going projects	Total funding	Funding executed in 2019
	European	-	-	-
	Others	1	135.627€	49.953 €
	Total	1	135.627€	49.953€
To	tal (National + International)	12	1.207.536 €	355.326 €

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	3	-	3
International patents	2	-	2
International meetings organization	1		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories	International	National	Total
and technical reports)	1	2	3

Theses and Dissertations

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Theses and dissertations			
PhD theses completed	1		
		In cooperation with international institutions	1
On-going PhD theses	27		
		In cooperation with international institutions	4
Master dissertations completed	33		

Major achievements

Flagship publications

The synergic effect of water and biomolecules in intracellular phase separation Nature Reviews Chemistry (2019) 3. 552–561.

Enhanced performance of fluorinated separator membranes for lithium ion batteries through surface micropatterning

Energy Storage Materials (2019) 21. 124-135.

Theoretical simulation of the optimal relation between active material, binder and conductive additive for lithium-ion battery cathodes *Energy*(2019)172.68-78.

Development of multifunctional liposomes containing magnetic/plasmonic MnFe204/Au core/ shell nanoparticles Pharmaceutics (2019) 11 (1). 10.

A simple and easy-to-prepare imidazole-based probe for the selective chromofluorogenic recognition of biothiols and Cu(II) in aqueous environments

Dyes and Pigments (2019) 162. 303-308.

Flagship projects



RES2VALHUM - Organic Residues Valorization: Production of Humic Substances

Aims to promote composting for the management and reduction of organic waste deposited in landfills. The compost produced will be evaluated and optimized for the content of humic substances, chemical profile and biological activity.



LUNGCHECK - Multiplex point-of-care device for lung disease biomarkers in sputum

LungCheck will develop an in-vitro point-of-care bioanalytical device based on sputum sampling and multiplex biomarker analysis, for early diagnosis of chronic obstructive pulmonary disease and lung cancer in high-risk patients.

Scientific recognition



N. Vilaça, J. Gallo, R. Fernandes, F. Figueiredo, A.M. Fonseca, F. Baltazar, M. Bañobre-López, I.C. Neves. Synthesis, characterization and in vitro validation of a magnetic zeolite nanocomposite with T2-MRI properties towards theranostic applications, Journal of Materials Chemistry B, 21 (2019) 3323-3472, http://dx.doi.org/10.1039/C9TB00078J.



H.M.R. Gonçalves, R.F.P. Pereira, E. Lepleux, T. Carlier, L. Pacheco, S. Pereira, A.J.M. Valente, E. Fortunato, A.J. Duarte, V. de Zea Bermudez, Electrochromic devices: Nanofluid based on glucose-derived carbon dots functionalized with [Bmim]Cl for the next generation of smart windows, Advanced Sustainable Systems, 7 (2019) 1970015.http://dx.doi. org/10.1002/adsu.201970015.



S. Ribeiro, N. Samanta, S. Ebbinghaus, J.C. Marcos, The synergic effect of water and biomolecules in intracellular phase separation, Nature Reviews Chemistry 3 (2019) 552 https://doi.org/10.1038/s41570-019-0120-4.

LABORATORY FOR INSTRUMENTATION AND EXPERIMENTAL PARTICLE PHYSICS

LIP is the reference laboratory for experimental particle physics and associated technologies in Portugal. It was founded in 1986 to exploit the unique opportunities created by the country's accession to CERN, the European Particle Physics Laboratory, the first international scientific organisation Portugal became a member of. LIP is committed to R&D in three main areas: experimental particle and astroparticle physics; development of new instruments and methods; scientific computing. At the centre of our mission is also advanced training, knowledge transfer, particularly in domains of healthcare, space exploration and information technologies, and the engagement of society with science.

The laboratory is nation-wide, with nodes in Braga, Coimbra and Lisbon, working in close collaboration with the local universities. The associates of LIP are the Foundation for Science and Technology, FCT), the Universities of Minho, Coimbra and Lisbon, Instituto Superior Técnico, the Faculty of Science of the University of Lisbon and the Electrical and Electronics Business Association. LIP has been a "Laboratório Associado" of FCT since 2001. LIP was rated "Excellent" in 2019, in the context of FCT's evaluation of the Research Units in Portugal. At national level, LIP has close to 200 members, including over 80 PhD researchers and 70 graduate students. LIP is the Portuguese reference partner of CERN, and also a partner of the European Space Agency, the GSI research centre in Germany, SNOLAB in Canada, the Pierre Auger Observatory in Argentina and the Sanford Underground Research Facility in the USA.

The node of LIP at UMinho was created in 2010, with the signature of a collaboration agreement between LIP and UMinho. Today it has about 30 members, including researchers, students and technicians.



LIP's activities at UMinho are organized in four lines: particle physics with accelerators, with the participation in the ATLAS experiment at CERN's Large Hadron Collider (LHC) and phenomenology studies related to precision measurements of the top quark and Higgs boson, as well as to searches for new physics; astroparticle physics, with the participation in the Pierre Auger Observatory for the study of the highest energy cosmic rays; advanced computing, with the participation in some of the largest R&D projects in this field and delivering services to the scientific community at large; and outreach to undergraduate students, schools and the general public.

Our vision for the future is to make sure that LIP will be present in the next great scientific discoveries of humankind, and lead science and innovation in Portugal in close connection with the academic and business communities.

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Director

Nuno Castro

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🛉 Staff

Total members

	Full m	Full members				
PhD	Internal	External	Total			
	5	-	5	5		
	PhD students	Others	Total			
Non-PhD	8	12	20			
Visiting researchers	-					
Technical staff	1					
Publications

1. Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated	Total
Indexed journals (Scimago quartile)	71	25	-	-	-	96
Indexed proceedings -						
Number of citations	6.701					
Publications with international collaboration		100%				
Publications in top 10% prominence percentile		57%				
		S	COPUS		Clariv	vate Analytics
Average impact of publications	CiteScore		SJR	SNIP		IF
	9,0		1,6	1,3		4,9

2. Non indexed indicators

	UMinho Repositorium	Оре	n access documents	Total downloads	
			103	3.573	
		Intern	ational	National	
	Communications	Oral	Poster	Oral	Poster
		9	-	6	-

\leftrightarrows Scientific dissemination and knowledge transfer

	Submitted	Granted	Total
National patents	-	-	-
International patents	-	-	-
International meetings organization	2		
Spin-offs and Start-ups with UMinho label	-		
Others (consultancy, exhibitions, observatories and technical reports)	International	National	Total
	-	1	1

Theses and Dissertations

Theses and dissertations PhD theses completed	1		
On-going PhD theses	5	In cooperation with international institutions	2
Master dissertations completed	3		

Major achievements

Flagship publications

Constraints on mediator-based dark matter and scalar dark energy models using $\sqrt{s} = 13$ TeV pp collision data collected by the ATLAS detector Journal of High Energy Physics (2019) 19 (142).

Search for large missing transverse momentumin association with one top-quark in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector Journal of High Energy Physics (2019) 05 (41).

A Roadmap for HEP Software and Computing R&D for the 2020s

Computing and Software for Big Science (2019) 3(7).

Role of the tth (h \rightarrow bb) rest frame in direct topquark Yukawa coupling measurements Physical Review D(2019)100(7), 07503/

Physical Review D(2019) 100 (7). 075034.

Probing the origin of ultra-high-energy cosmic rays with neutrinos in the EeV energy range using the Pierre Auger Observatory

Journal of Cosmology and Astroparticle Physics (2019) 10 (022).

Flagship projects



BigDataHEP - Understanding Big Data in High Energy Physics: finding a needle in many haystacks (PTDC/FIS-PAR/29147/2017)

The goal of BigDataHEP is the development of advanced techniques to be used to analyse the data collected by the experiments of the Large Hadron Collider and by detectors searching for dark matter interactions. Furthermore, the techniques developed in the project will be transferred to the electronics industry to address quality control challenges.



Collaboration in the ATLAS Experiment at CERN: Data Taking and Analysis (CERN/FIS-PAR/0002/2019)

The aim of this project is to support the Portuguese participation in the ATLAS Collaboration at CERN. The LIP-Minho team has a key role in the top quark measurements, searches for new physics phenomena associated to the top quark and in the ATLAS forward detector. Currently three PhD Theses are being developed in this scope.



UHECR Physics with the Pierre Auger Observatory (CERN/FIS-PAR/0031/2019)

The aim of this project is to support the Portuguese participation in the Auger Observatory. The LIP- Minho team is involved in the data analysis collected to better understand the cosmic rays with extreme energies, as well as on the upgrade of the detectors, contributing to the direct measurement of muons in air showers.

Scientific leadership



Nuno Castro, from LIP-Minho, represents Portugal in the Working Group on Governance

The CERN Council established a Working Group on Governance to review the relevant aspects of CERN organization. This Working Group is expected to discuss in depth if recommendations should be made to the Council, in order to ensure that the overall governance framework is adequate for continued smooth decision-making with an enlarged membership and for reaching decisions on future major projects of CERN.

EUROPEN RESEARCH COUNCIL

Right from its creation, the European Research Council, known by the acronym ERC (European Research Council), constitutes a significant change in the European policies for science, corresponding at the same time to the fulfilment of an ambition that has long been cherished by the scientific community. Officially launched at the Berlin Conference in February 2007, the ERC became a new instrument of the EU's Framework Programs (7th at the time), supported by independent bodies, both at the level of science (Scientific Council) as well as program management (Executive Agency) and oriented towards the development of excellent research and a leading scientific community in the European Research Area. This is clearly stated in its mission declaration, where the ERC is assumed to be a fundamental tool to "encourage the highest quality research in Europe through competitive funding and to support investigator-driven frontier research across all fields, based on scientific excellence".

Being "investigator-driven", or "bottom-up", in its nature, the ERC approach allows researchers to identify new opportunities and directions in any field of research, rather than being led by priorities set by politicians. This ensures that funds are channelled into new and promising areas of research with a greater degree of flexibility. Research that promises to be only an incremental advancement of knowledge. This is irrespective of the field and whether it has societal, medical or clinical applications.

In basic terms, ERC has its main focus on strengthening and shaping the European research system, by setting up a high-quality peer-review procedure, the establishment of international benchmarks of success, and the provision of up-to-date information on who is succeeding and why. In this respect, the ERC grants stand out, asking researchers to reach their highest competitive and innovation capacity levels. No more than scientific excellence is expected, which is also the main criterion for selection. The aim is to recognize the best ideas, the think big approach.

There are three main schemes in the ERC funding, varying from the *ERC Starting Grants*, aimed for researchers with two to seven years' experience after PhD, to *ERC Consolidator Grants* that are focused on researchers with seven to twelve years experience after PhD and the *ERC Advanced Grants*, pointed to researchers with a track-record of significant research achievements in the last ten years. Additionally, there are two other sources of funding, which vary from the *ERC Proof of concept*, which is focused on those researchers that sick for the societal potential or commercialization of their previous funded ERC grant, and the ERC Synergy Grants, aimed for two to four researchers working together and bringing different skills and resources to tackle ambitious research problems.



Researcher Alexandra P. Marques

Research centre 3B's Research Group

Project

ECM_INK - Cells-self Extracellular Matrices-based Bioinks to create accurate 3D diseased skin tissue models

Main scientific area Medical Biotechnology

Funding awarded 1.998.939 €

ERC grant period May 2017 to November 2022

Description

It has been recognized that growing cells within 3D structures reduces the gap between 2D in vitro cell cultures and native tissue physiology. This has been paving the way for the development of reliable 3D in vitro cell-based platforms with major impact in the reduction/elimination of animal experimentation, diseases modelling and drug development. Recently proposed bioprinting technologies that allow accurate and high speed deposition of various cells and matrices at high resolution, are expected to play a key role in the development of those physiologically reliable 3D in vitro tissue models.

Thus, ECM_INK intends to develop cells-self extracellular matrices-based bioinks to create accurate and pathophysiological relevant 3D in vitro diseased skin tissue models. The use of cells from patients suffering from chronic, genetic and neoplastic skin diseases represents a major advantage that will be reflected in the accuracy and functionality of the respective 3D in vitro models.



Main achievements

ECM_INK aims to develop new bioinks that fully mimic the native environment to be recreated hypothesizing that this is mandatory to be able to build accurate skin models fully representative of the pathophysiology of chronic, genetic and neoplastic skin diseases. The main achievements so for are:

• A bank of skin cells obtained from patients suffering from dystrophic epidermolysis bullosa, squamous cell carcinoma and pemphigus vulgaris as result of collaborations established with international partners or with Hospital S. João;

• Fingerprint of the cell's-self extracellular matrix associated to each disease;

• Proprietary method for extracting extracellular matrix components and prepare specific bioinks;

• Proprietary 3D printer adapted to the specificities of the developed bioinks;

• Proprietary dynamic system capable of providing the unprecedented culture requirements for the skin models to be developed, and of supporting the continuous monitoring of key pathophysiological markers.



Researcher Manuela E. Gomes

Research centre

3B's Research Group, I3Bs - Research Institute on Biomaterials, Biodegradables and Biomimetics, University of Minho

Project

MagTendon - Magnetically Assisted Tissue Engineering Technologies for Tendon Regeneration

Main scientific area Physical and Engineering Sciences

Funding awarded

1.999.854 €

ERC grant period

01 May 2018 to 30 April 2024

Description

Tendon injuries account for a considerable share of musculoskeletal pathologies that can dramatically affect patient's quality of life, being estimated that over 30 million human tendon-related procedures are taking place annually worldwide. The poor healing ability of tendons as well as the limitations of currently used therapies have motivated tissue engineering (TE) strategies to develop living tendon substitutes. The main goal of MagTendon consists in obtaining unique cell-laden 3D magnetically responsive systems that recapitulate key features of the native tissue and that can be further remotely modulated both in vitro and in vivo by the application of external magnetic stimuli. MagTendon is thus exploring conventional and innovative tools such as multimaterial 3D bioprinting to design magnetic responsive systems mimicking specific aspects of tendon tissue architecture, composition and biomechanical properties, which, combined with adequate stem cells,



will render appropriate behavioural instructions to stimulate the regeneration of tendon tissue.

Main achievements

MagTendon main achievements in 2019 were related with i) the development of advanced nanoplatforms based on magnetic nanoparticles for stem cell selection/activation; ii) conceiving innovative magnetic stimuli-responsive 3D constructs with biomimetic architecture and mechanical behaviour, where laden stem cells are governed by their ability to sense their environment and respond to structural and biomechanical cues being guided into the tenogenic lineage, and iii) establishment of cellular models for enabling greater understanding on the molecular mechanisms involved in tendon healing that will be returned for designing improved technologies and therapies. In 2019, The outcomes resulted in the publication of 9 scientific articles in high impact factor journals, 2 book chapters published in reference books, and 1 review paper. During 2019, other publications (7 research articles, 3 review articles, 3 book chapters) were also under preparation.



Researcher Paulo B. Lourenço

Research centre

Institute for Sustainability and Innovation in Structural Engineering – ISISE

Project

New Standards for Seismic Assessment of Built Cultural Heritage (STAND4HERITAGE – S4H)

Main scientific area Civil Engineering – Earthquake engineering – Masonry

Funding awarded

2.968.755€

ERC grant period September 2019 to August 2024

Description

STAND4HERITAGE ambitiously engages in introducing new standards for safeguarding built cultural heritage for the next generations, which is a major societal demand. Since mainly designed for gravity loads, masonry buildings (about half of the built heritage) are vulnerable to seismic actions, resulting in brittle out-of-plane failures, acknowledged as the main cause for losses and injuries to people. A recent blind exercise to predict the capacity of a masonry structure to resist a dynamic excitation demonstrated that, although advanced simulation tools are available, we are still unable to consistently provide a collapse estimate (Figure 1). The project follows a stochastic approach because both material heterogeneity and seismic characteristics variation result in highly scattered seismic capacities. S4H will generate novel integrated stochastic-based models of seismic signals, datasets of masonry dynamic behaviour evaluated through shaking-table campaigns, computationally efficient numerical approaches, and an integrated analytical tool for the out-of-plane seismic assessment of heritage buildings.



Figure 1 A recent blind benchmark for an existing masonry building tested in a shaking table.

Main achievements

The first step of the project involves the design of the testing equipment: A shaking-table of 3m x 3m, which weighs 3 ton and can carry a specimen up to 3 ton at an acceleration of 4g. Moreover, the specimen mounted on the table can be fully monitored thanks to a Digital Image Correlation (DIC) system, with full-field measureaments in 3D with a single computer vision model. The DIC particularity relies on the 6 cameras with 5 MP and 163 fps used to track the specimen. Combined, the shaking-table and the image system represents a testing facility not available elsewhere, allowing truly unique possibilities.

In addition, the team addressing the challenge of S4H has started to be assembled with the selection of three post-doctoral fellows from France, Greece and India, two PhD candidates from Greece and Italy and one shaking-table mechanical engineer from Portugal.

Website www.stand4heritage.org



Researcher Helena Machado

Research centre

Communication and Society Research Centre (CECS)

Project

Forensic Geneticists and the Transnational Exchange of DNA data in the EU: Engaging Science with Social Control, Citizenship and Democracy (EXCHANGE)

Main scientific area

Sociology

Funding awarded 1.838.150 €

ERC grant period 1st October 2015 to 30th September 2021

Description

The EXCHANGE project focus on European Union security policies and technological surveillance practices within police and judicial cooperation. The empirical topic is the mandatory reciprocal automated exchange of genetic data among EU countries for the purpose of combating cross-border crime and terrorism, under the so-called Prüm Decisions and in the broad framework of creation of an area of freedom, security, and justice for Europe. It tackles the close links between a highly-specialized field of expert scientific knowledge – forensic genetics – and threats to privacy and data protection in the EU in the 21st century. At the core of the research questions addressed by the EXCHANGE project are considerations of what oversight of transnational practices of sharing sensitive data of citizens is needed, and what should be the balance between state uses of



such powers and the rights – to autonomy, liberty, privacy, security, and justice – of individuals subjects and communities, based on the principle of human dignity.

Main achievements

A major output of the project has been the study of the views of diverse stakeholders, including political actors, policymakers, practitioners, supervision authorities, non-governmental organizations, academics, and the press media in 25 European countries, the EX-CHANGE project results are able to significantly impact discussions on security policies and data protection. More particularly, the EX-CHANGE project is producing empirically robust recommendations directed towards governance practices and policy-making principles founded on transparency, accountability and public trust at a national and international level. The project outcomes might also impact in the design of public policies aimed to prevent discrimination, and raise awareness of risks to privacy and equality deriving from police methods of assigning race or ethnicity. EXCHANGE also appraises the need of incorporating ethics and moral risks assessment in the activities of technology developers and of police agencies directly involved in the fight against criminality and terrorism.

During 2019, the team produced 13 articles published in ISI and SCOPUS journals and one monograph (Palgrave) published in English, Portuguese and Chinese (simplified).

Website

www.exchange.ics.uminho.pt



Researcher Rogério Pedro Lemos de Sousa Pirraco

Research centre 3B's Research Group

Project

CapBed - Engineered Capillary Beds for Successful Prevascularization of Tissue Engineering Constructs

Main scientific area Bioengineering

Funding awarded 1.5M €

ERC grant period

November 2018 – October 2023

Description

CapBed aims at developing a new technology to fabricate in vitro capillary beds that include a vascular axis that can be anastomosed with a patient circulation. Such capillary beds will be used as prime tools to prevascularize bioartificial tissues in bioreactor systems, which will allow fast perfusion of the tissues after transplantation to a patient, ensuring their viability and function.

Main achievements

The final core team of the project was assembled with the hiring of Cláudia Gomes (MSc), Daniela Cruz-Moreira (PhD), Helena Faria (MSc) and Kátia Mesquita (PhD).





PROJECTS + 500.000 €

At UMinho, research is seen as a global enterprise, seeking for the answers to the main challenges of our times. In this sense, research is essentially international and it requires the continuous reinforcement of international collaborations and participation in international initiatives, namely in the context of European Research Area. At the same time, we are always committed with the multiplier effects of the science we do in socio-economic and cultural development of the country and of our region.

In this sense, research projects and their global funding is something that we are much concerned in strengthening and support. I the past few years there has been a rise in project funding, which shifted control over large amounts of research funds towards funding agencies that distribute these funds across groups or individuals. The distribution of funds takes place through competitive selection procedures for which our researchers have to apply by writing complex proposals. Project proposals are reviewed through peer review committees, aiming to finance the best among the best.

The attraction of competitive funding for research (national and international) has changed over the past few years in UMinho, not only as a result of an increasing involvement of our research units and their researchers, but also from the increase of quantity and, above all, the quality and recognition of our research. The introduction of performance-based and competitive project funding mechanisms is introducing a differentiating effect on the distribution of research funding across our research units and individual researchers. One of the clearest demonstrations of this effect is the increasing number of projects with relatively high budgets. Beyond the ERC grants, UMinho had in 2019 eighteen (18) projects running with a budget of more than 500.000 \in (internal budget). Together, these 18 projects contributed with more than 20% of the total budget of on-going projects. This research funding leads to the continuous growth and strengthening of the organizational level by the increase of research quality aimed at creating critical mass and sustainability of UMinho's research.

ALGAVALOR – MicroALGAs: produção integrada e VALORização da biomassa e das suas diversas aplicações

Leading promotor

ALLMICROALGAE - ALLMICROALGAE NATURAL PRODUCTS, S.A.



UMinho pincipal investigator

Alexandra P. Marques (SubProject 3 - Valorization of microalgae for natural cosmetics)

Research centre

3B's Research Group

Project consortium

CIIMAR - CENTRO INTERDISCIPLINAR DE INVESTIGAÇÃO MARINHA E AMBIENTAL; UA - UNIVERSIDADE DE AVEIRO; UM - UNIVERSIDADE DO MINHO; UCP - UNIVERSIDADE CATÓLICA PORTUGUESA; UP - UNI-VERSIDADE DO PORTO; ISA - INSTITUTO SUPERIOR DE AGRONOMIA DA UNIVERSIDADE DE LISBOA; UALG - UNIVERSIDADE DO ALGARVE; LNEG - LABORATÓRIO NACIONAL DE ENERGIA E GEOLOGIA I.P.; IPL - INSTITUTO POLITÉCNICO DE LEIRIA; NECTON - COMPANHIA POR-TUGUESA DE CULTURAS MARINHAS S.A.; VALORGADO - AGRICULTU-RA E PECUÁRIA, LDA; LIPOR - SERVIÇO INTERMUNICIPALIZADO DE GESTÃO DE RESÍDUOS DO GRANDE PORTO; CASTELBEL - ARTIGOS DE BELEZA, S.A.; EM - ERNESTO MORGADO, S.A.; EFP - EMPRESA FIGUEIRENSE DE PESCA LDA; ALLMICROALGAE - ALLMICROALGAE NATURAL PRODUCTS, S.A.; INIAV - INSTITUTO NACIONAL DE INVES-TIGAÇÃO AGRÁRIA E VETERINÁRIA, I.P.; VAISA - AGRICULTURA IN-TENSIVA, S.A.; NARCISO - NARCISO DIAS & FILHOS LDA

Global funding

10.481.791 €



UMinho funding 500.000 €

Project funding period January 2018 to March 2022

Description

Subproject 3 (SP3) - Valorization of microalgae for natural cosmetics - aims at promoting the value chain until transforming raw materials (biomass and extracts) into applications for the natural and sustainable cosmetics sector. This subproject has the following specific objectives: Objective 1. Select value added raw materials / strains for the pharmaceutical sector; Objective 2. Know and characterize the bioactivity of the extracts of the selected strains; Objective 3. Develop new enriched biomasses; Objective 4. Fraction the extracts with activity; Objective 5. Develop formulations for the cosmetic industry by potential end-users: from proof to concept.

Main achievements

Different cyanobacterial strains (Nodosilinea nodulosa, Synechocystis salina, Cuspidothrix issatschenkoi, Nostoc sp., Nodularia sp. and Tychonema sp), and microalgae species (Nannochloropsis oceania; Chlorella vulgaris; Phaeodactylum tricornutum; Tetraselmis copi; Chlorococcum sp) were selected for biomass production according to their cosmeceutical potential. Extracts were obtained using specific extraction conditions, that varied in pressure used, time, and solvents. The different processed extracts were then evaluated in terms of phytochemistry and bioactivity, which enabled the selection of the best conditions to use for the upcoming studies on cosmeceutical potential, according to yield, phytochemical composition and cytotoxicity in skin cell lineages.

Website

https://labs.3bs.uminho.pt/files/projects/613-algavalor.pdf

Survey of Health, Ageing and Retirement in Europe (SHARE)

Principal investigator

Axel Börsch-Supan, Ph.D. from the Munich Center for the Economics of Aging (MEA), Max Planck Institute for Social Law and Social Policy.



UMinho pincipal investigator Alice Delerue Matos

Research centre Centro de Estudos de Comunicação e Sociedade (CECS)

Project consortium SHARE-ERIC (at the international level) and SBE-NOVA (in Portugal)

Global funding (for Portugal) 1.901.370 €

UMinho funding 1.373.315 €

Project funding period (for Portugal) January 2018 to March 2022

Description

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a research infrastructure for studying the effects of health, social, economic and environmental policies over the life-course of European citizens and beyond. From 2004 until today, 480,000 in-depth interviews have been conducted with 140,000 people aged 50 or older from 28 European countries and Israel (figure 1). Thus, SHARE is the largest pan-European social science panel study providing internationally comparable longitudinal micro data.



Portugal is part of the above scientific infrastructure since 2010, having participated in 4 waves of data collection.

SHARE is centrally coordinated by the Munich Center for the Economics of Aging (MEA), Max Planck Institute for Social Law and Social Policy. It has become a role model for several ageing surveys worldwide (Brazil, China, Thailand, Japan, México, etc.)

Main achievements

In 2019, SHARE collected wave 7 data, focusing on respondents' life histories, and made it available to the scientific community worldwide. SHARE has released its latest First Results Book in June 2019. Based on data from Wave 6 and 7, the book presents 38 short studies covering the topic Health and Socio-economic Status over the Life Course. 85 authors from 17 countries, including researchers from the Portuguese SHARE team, contributed to this comprehensive volume.

To be able to integrate new and innovative cognitive measures to the SHARE questionnaire in Wave 8, carefully selected measures were tested during Pretest and Field Rehearsal, both conducted in 2019. The measures allow SHARE to contribute to the knowledge on the causes of dementia.

In September 2019, SHARE has reached a milestone by recording its 10,000th user registration. This is reflected in the number of publications based on SHARE data, which had risen to more than 2,600 by the end of 2019.

Website

www.share-project.pt

High Performance Polyhydroxyalkanoates Based Packaging to Minimize Food Waste (YPACK)

Principal investigator

José Maria Lagarón Cabello (CSIC – Spain)



UMinho pincipal investigator António Augusto Vicente

Research centre Centre of Biological Engineering - CEB

Project consortium

Agencia Estatal Consejo Superior de Investigaciones Científicas – CSIC (Spain), Avecom, N.V. (Belgium), Bioinicia, S.L. (Spain), Biotrend, S.A. (Portugal), European Food Information Council (Belgium), Fundación Gaiker (Spain), Laboratório Ibérico Internacional de Nanotecnologia (Portugal), Intertek Italia SpA (Italy), KPAD, Ltd. (UK), Laser Consult Muszaki-Tudomanyos es Gazdasagi Tanacsado Korlatolt Felelossegu Tarsasag (Hungary), Linpac Packaging Pravia S.A. (Spain), Melodea, Ltd. (Israel), MIGROS Ticaret Anonim Sirketi (Turkey), Nova ID FCT (Portugal), Company for Software Production, Trade and Services PRAJM APPS, LLC (Macedonia), SONAE Center Serviços II, S.A. (Portugal), TECNOPACKAGING, S.L. (Spain), TUTTI PASTA S.A. (Spain), Unió Corporació Alimentaria, SCCL (Spain), Wageningen University (The Netherlands)

Global funding

7.277.671€



Project funding period November 1st 2017 to April 2021

Description

The main objective of YPACK is the pre-industrial scale up and validation of two innovative food packaging solutions (thermoformed tray and flow pack bag) based on PHA, with active and passive barrier properties. New packaging will use food industry by-products (cheese whey and almond shells), assure the biodegradability and recyclability, and reduce food waste, in the frame of the EU Circular Economy strategy. YPACK will use a holistic approach and methodology involving different knowledge areas: Development of packaging solutions (Production of PHBV layers, compounding, prototyping, Industrial Validation), Product Validation (Quality / Shelf life), Social approach (Customer profiling, Dissemination, Policies & Regulatory) and Market Assessment (Business study and Risk assessment).

Main achievements

• The Project has finished the development of the packaging designs and started the scaling up (March 2019):

• Production at pilot-scale of PHBV, the main ingredient of YPACK packaging materials from biological origin (food by-products) + purification protocol development achieved;

• First pre-industrial trial for the production of YPACK packaging film: 2 km of film with a thickness of 50 microns with a level of PHA at 50%:

Website

www.ypack.eu

UMinho funding 600.320 €

BIOTECNORTE - Underpinning Biotechnology to foster the north of Portugal bioeconomy



Principal investigator / UMinho pincipal investigator Eugénio Campos Ferreira

Research centre CEB - Centre of Biological Engineering

Project consortium UMinho

Global funding / UMinho funding 3.498.352 €

Project funding period

July 1st 2016 to September 2020

Description

BioTecNorte was built around three research lines that are aligned with the most relevant fields of interest in the North region. These research lines are:

• The Bio-factory – Biotechnology as a key enabling technology for new processes, products and resource recovery;

• The Smart food factory - Smart systems for a sustainable and environmentally friendly food industry;

• The Nature factory- innovative biopharmaceutics, medical devices, cosmetics and fine chemistry.

The project aimed at fostering northern bio-based-economy, by bringing value to resources, wastes and by-products, aligned with



the circular economy and industrial symbiosis concepts. It is our goal to develop and make-use of green and sustainable key innovative technologies, namely industrial biotechnology and nanotechnology, to create added-value products to meet our future societal needs in health and food sectors ensuring environmentally friendly practices.

Main achievements

Publications through international peer reviewed journals and books target researchers and professionals to new biotechnology applications regarding industry, agro-environmental sciences and Food & Health. 336 papers and 120 book chapters were published in the context of BioTecNorte since July 2016. Also, 29 patents were registered to protect the generated knowledge. The project also contributed to the training of young researchers validated by the conclusion of 32 PhD theses.

Several events were organised with the aim to disseminate Bio-TecNorte and drive communities involved in the project, fostering the recruitment for activities carried out in different research lines - such as the training needs assessment, dialogue events, workshops, open days and others.

Website

www.ceb.uminho.pt/Projects/Details/6040

HAMaBICo – Hybrid Additive Manufacturing for Bio-Inspired Components



Principal investigator / UMinho pincipal investigator Filipe Samuel Silva

Research centre CMEMS-Center for Micro-Electro Mechanical Systems

Project consortium UMinho

Global funding / UMinho funding 750.100 €

Project funding period May 1st 2016 to April, 30th 2020

Description

The project is concerned with the development of either a new technology as well as new prototypes of components, mainly in the medical area. The technology is a multi-material 3D printing, using metals and high tech ceramics, new at world level. The components are mainly implants and prosthesis, with multi-functionality.

Main achievements

1. The technology is developed at laboratory level. It is expected it's scale-up for industrial level, in the following months;

2. Different prototypes were developed for different industrial fields namely medical area, aeronautics, automotive, among other. Different other projects were started based on the Hamabico project;

3. Five patents were submitted at world level, of five products, and



around 240.000 euros were invested already in intellectual property, for these five patents. A spin-off is in process os creation to launch these products. See www.microZrVeneers.com.

Website

www.hamabico.pt / www.microzrveneers.com

Imply – Development of Advanced Hybrid Implants



Principal investigator / UMinho pincipal investigator Filipe Samuel Silva

Research centre CMEMS-Center for Micro-Electro Mechanical Systems

Project consortium

UMinho, Instituto de Implantologia, LabImplant – Laboratório e Comercialização de Próteses Dentárias, S.A

Global funding 1.522.631 €

UMinho funding 504.374 €

Project funding period (for Portugal) January 1st 2018 to December, 31st 2022

Description

The project is concerned with the development of a hybrid implant, with the fracture toughness of titanium metal and aesthetics of a white ceramic, including zirconia and/or Calcium phosphates such as Hydroxiapatite, for the dental area.

Main achievements

The project is in course and some preliminary prototypes were already obtained. Improvements in the mechanical resistance and aesthetics/colour are in due course and expected to be finished in 2021, to proceed do animal and clinical tests. A patent is expected



to be issued, along with the companies involved, based on this new product/technology.

MoedInov – New aesthetics for collection coins by using advanced technologies



Principal investigator / UMinho pincipal investigator Filipe Samuel Silva

Research centre CMEMS-Center for Micro-Electro Mechanical Systems

Project consortium UMinho, Imprensa Nacional Casa da Moeda

Global funding 783.361 €

UMinho funding 517.311 €

Project funding period (for Portugal) November 1st 2018 to October, 31st 2022

Description

The project is concerned with the development of coin for collections with new aesthetics based on new materials combinations including metals such as titanium, gold, silver, among other, and high tech ceramics such as zirconia or alumina. The project is being carried out with Portuguese Top Designers like Eduardo Aires and Vhils (Alexandre Manuel Dias Farto).



Main achievements

The project is in course and some preliminary prototypes of coins both in titanium and in Silver were obtained and their developments are in course. It is expected that by 2022 five collections of coins are issued by INCM.

Enhancing Smart GRIDs for Sustainability - ESGRIDS

Principal investigator João Peças Lopes



UMinho pincipal investigator João Luiz Afonso

Research centre ALGORITMI

Project consortium INESC TEC; INESC Coimbra; C-MAST; ALGORITMI

Global funding 2.091.065 €

UMinho funding 578.195 €

Project funding period January 1st 2017 to 31st December 2020

Description

The project ESGRIDS constituted a consortium involving research centers of 4 Portuguese Universities, namely the University of Porto (INESC TEC), the University of Minho (Centro ALGORITMI), the University of Coimbra (INESC Coimbra), and the University of Beira Interior (C-MAST). ESGRIDS aims at developing new scientific methodologies that result in disruptive solutions to meet the challenges that future electrical power systems will face. This is achieved by implementing a multidisciplinary approach that brings significant de-



Figure 1 Developed Power Electronics prototypes: (a) UPQC; (b) Solid-State Transformer; (c) Bidirectional Battery Charger for Electric Vehicles.

velopments with respect to the main actors of the electrical power system: end-users of energy, network operators and markets/regulation. These actors thus define the three main areas of activity of the proposed project, namely: Energy End User; Operation and Control of the Distribution Network; Market and Business Models. Regarding the University of Minho, innovative solutions that contribute to a sustainable and efficient electrical power system were developed.

Main achievements

In the scope of the ESGRIDS project, a set of contributions based on Power Electronics prototypes were developed in the Centro AL-GORITMI of the University of Minho, mainly in terms of electric mobility and power quality improvement to the future Smart Grids, as highlighted in figure 1. Regarding Electric Mobility, it was developed a novel topology of Bidirectional Battery Charger for Electric Vehicles, allowing the operation modes Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G), as well as other innovative operation modes to support Smart Grids. For the improvement of Power Quality, it was developed a Unified Power Quality Conditioner (UPQC - integrating Renewable Energy and Energy Storage as advanced contributions), and also an innovative Solid-State Transformer, both allowing the introduction of new functionalities to the Smart Grids.

Website

www.esgrids.eu

Technologies for sustainable and smart innovative products - TSSiPRO



Principal investigator Júlio C. Viana

UMinho pincipal investigator Júlio C. Viana, IPC Ana Vera Machado Nóbrega, IPC Maria Rocha, 2C2T

Research centre

IPC – Institute for Polymers and Composites

Project consortium

Research Centers of U. Minho: IPC – Institute for Polymers and Composites 2C2T- Centro de Ciência e Tecnologia Têxtil CAlg - Centro Algoritmi Lab2PT - Landscapes, Heritage and Territory Laboratory

Global funding 1.980.000 €

UMinho funding

1.680.000€

Project funding period

May 2016 to November 2020

Description

TSSIPRO project investigated and provided cutting edge scientific and technological advancements on sustainable and smart innova-



tive technologies and systems based on polymers and textiles, integrating embedded systems and design/eco-design tools. The project was structured in 3 integrated research lines:

• RL1 – Sustainable and Multifunctional Material

development novel sustainable and multifunctional polymeric systems, porous membranes, and advanced filaments/fibres/films for sensors and energy storage.

• RL2 – Smart polymer technologies based on microtechnologies, polymeric moulded products with embedded functions, multifunctional films/fibres and smart e-composites.

• RL3 - smart textile systems

based on novel wearable sensors, energy harvesting and storage textiles, micro-nano surfaces functionalization processes, and smart e-composites.

Main achievements

TSSIPRO project involved 74 researchers, from which 21 PhD and 9 MSc grants were contracted over the project duration. A total of 15 MSc and 5 PhD students were graduated. A total of 25 articles were published in indexed international journals, more than 20 presentations in international conferences were delivered, and 3 patents were submitted. The project also delivered in 2019, 11 New methods/materials and 8 prototypes.

Micro and Nanofabrication Research Infrastructures Network in Portugal (Micro&NanoFabs@PT)

Principal investigator Paulo Freitas



UMinho pincipal investigator Manuel Silva

Research centre CMEMS-UMinho

Project consortium INL; INESC-MN; CMEMS-UMinho

Global funding 6.033.529 €

UMinho funding 800.736 €

Project funding period October 1st 2017 to March 31st 2021

Description

The Micro and Nanofabrication Research Infrastructures Network in Portugal (Micro&NanoFabs@PT) aims to integrate and provide shared access to micro-nanofabrication and design tools within the research community and industry, as well as to increase competitiveness in the current strategic areas linked to the application of micro



and nanotechnologies in the medical, environmental, electronics/ energy, food, automotive and defense/aerospace fields.

Main achievements

The implementation of the MNFabs/CMEMS-UMinho laboratory (total area 300 m²) at CIIES – Vale de S. Cosme, Vila Nova de Famalicão with the support of city-hall Vila Nova de Famalicão. This infrastructure has climatic control, clean room area, photolithography area, characterization area (mechanical, optical and electrical), water treatment system, industrial nitrogen line, compressed air and gas lines for semiconductor fabrication. Moreover, the acquisition of new equipment as: atomic layer deposition system (ALD), a direct write laser system (DWL), a reactive ion etching system (RIE), a gas scrubber system and an ellipsometer to increase the fabrication and characterization capabilities of the CMEMS-UMinho Centre.

Website

www.micronanofabs.inl.int

Achilles - Overcoming specific weaknesses in tendon biology to design advanced regenerative therapies



Principal investigator / UMinho principal investigator Manuela E. Gomes

Research centre

3B's Research Group, I3Bs - Research Institute on Biomaterials, Biodegradables and Biomimetics, University of Minho

Project consortium

University of Minho (UMINHO) with Prof. Manuela Gomes as project coordinator; the Department of Trauma Surgery of the University Regensburg Medical Centre (UHREG) represented by Prof. Denitsa Docheva; and the Regenerative, Modular & Developmental Engineering Laboratory of the National University of Ireland Galway (NUIG) represented by Prof. Dimitrios Zeugolis. In addition, the project also counts with a close collaboration with the Rehabilitation Medicine Research Center of Mayo Clinic (MAYO) represented by Prof. Cristopher Evans who is also the head of the Advisory Board of the project.

Global funding

999.626€

UMinho funding 500.601 €

Project funding period

October 1^{st} 2018 to June 30^{th} 2022



Description

Achilles is a H2020 WIDESPREAD Twinning project that has as main goal of to significantly strengthen our science and technology capacity in tendon biophysics, cell/molecular biology and genetics/gene therapy in order to achieve global scientific excellence and competitiveness for the translation of advanced therapies to treat tendon injuries/diseases. At the same time, Achilles also aims at positioning our research profile in this area in an outstanding international research level. These goals will be achieved creating strong links with the project partners/collaborators who have a high and complementary scientific expertise, allowing a constant and sustained knowledge sharing and research collaboration network which shall continue sustainably in the long-term.

Main achievements

Two Thematic Conferences were organized: "Molecular and biological mechanisms of tendon homeostasis and repair" (Porto, 8-10th July 2019), and "Tendon biophysical environment" (Braga, 4-5th November 2019), with more than 170 attendees. Both conferences included i) master classes/keynote lectures from recognised researchers in the field, ii) round tables and scientific discussion between young researchers and the world-leading speakers, iii) oral, poster and rapid-fire presentations by young researchers, and iv) social and cultural activities. Moreover, several dissemination activities were carried out, such as the attendance to major international conferences in the field (such as the 27th EORS Meeting 2019, TERMIS-EU Meeting 2019, SFB Meeting & Exposition 2019, and ScSB Meeting 2019), organization of joint symposia (at the 27th EORS Meeting 2019 and TERMIS-EU Meeting 2019), several joint scientific publications, edition of a journal special issue, and organization of Open days and visits from regional high-schools and university students in the consortium organizations.

Website

www.achilles.i3bs.eu

Frontiers of technology for theranostics of cancer, metabolic and neurodegenerative diseases (FROnTHERA)



Principal investigator / UMinho pincipal investigator Nuno João Meleiro Alves das Neves

Research centre

3B's Research Group

Project consortium

University of Minho - 3B's Research Group; International Iberian Nanotechnology Laboratory- INL; University of Minho, Life and Health Sciences Research Institute - ICVS

Global funding 3.864.360 €

UMinho funding 3.169.652 €

Project funding period

April 1st 2016 to July 2020

Description

FROnTHERA aims at significantly impact the field of tissue engineering and regenerative medicine, cancer, diabetes and neurodegenerative diseases by means of strengthening research within the interdisciplinary domains of 3D tissue engineered in vitro models of diseases, microfluidics, nanotechnologies, molecular biology and embedded biosensors for theranostic of RIS3 priority diseases, and in particular, for cancer, diabetes and neurodegenerative diseases. FROnTHERA is an initiative of three top leading research units, located in the PT convergence region (Norte de Portugal), whose main



goal is to advance in research for developing tools and technologies to be used as alternative to animal experimentation and in personalized therapies for human health. This scientific endeavour will result from a research collaboration process between 3B's (coordinator) and ICVS, both from UMINHO, and INL (International Iberian Nanotechnology Laboratory), institutions of research and innovation of excellence and aims to have a spillover effect on the regional economy.

Main achievements

The activities of this project promoted the scientific cooperation between the involved Research Units ICVS and 3Bs from the UMINHO, and with the INL during the course of the FROnTHERA project. It enabled the development of strong scientific outputs in the following areas: 1) Scientific and technological progress in 3D tissue engineered in vitro models of diseases, microfluidics, nanotechnologies, molecular biology and embedded biosensors for theranostic;

2) Stronger collaboration between the 3Bs and ICVS at the UMIN-HO and INL that will facilitate the establishment of international partnerships for the attraction of private and public research funds, namely from Horizon EUROPE; 3) Opportunities for scientific jobs in the PT11 region. 4) Filing of 9 patents; 5) Published 18 peer reviewed scientific papers and 5 book chapters; 6) Four MSc thesis in progress; 7) Twelve PhD thesis in progress.

The FROnTHERA outputs in 2019 exceeded largely the indicators initially proposed.

Website

www.3bs.uminho.pt/projects#projectid-486

New avenues for the development of personalized medical interventions for neurological, oncologic and surgical disorders – "PersonalizedNOS"



Principal investigator / UMinho pincipal investigator Nuno Sousa

Research centre Life and Health Sciences Research Institute (ICVS)

Project consortium UMinho

Global funding / UMinho funding 3.802.243 €

Project funding period April 1st 2016 to July 2020

Description

The project PersonalizedNOS is fully aligned with the goals of RIS3, addressing forefront developments on neurosciences, oncology and surgical sciences. By providing scientific breakthroughs in the understanding of molecular, cellular and genetic profiles that contribute for the disease susceptibility, this project contributed to diagnostic procedures, to generate predictive data and to tailor therapeutic interventions.



Main achievements

The scientific and technological objectives have been achieved, as measured by the proposed indicators which, were, in several cases, greater than the outcomes originally expected. In addition to these metrics, it is important to note that a significant set of results obtained within the scope of the project are still in the submission or preparation phase for submission, either for publication in scientific journals or for registration with intellectual property entities. Overall, in addition to generating highly qualified scientific jobs (15 positions), this project has resulted in more than 250 scientific articles published in international peer-reviewed journals to date, more than 100 doctoral theses, 10 patents international and 5 software solutions.

Advanced THermomechanical mOdelling of Refractory linings – ATHOR

Principal investigator

Professor Marc Huger (University of Limoges, FR)



 Image: Sector sector

Figure 1 ATHOR – Work-package overview.

UMinho pincipal investigator Paulo B. Lourenço

Research centre

Institute for Sustainability and Innovation in Structural Engineering – ISISE

Project consortium

University of Limoges (FR); University of Minho (PT); AGH University (PL); RWTH Aachen University (DE); Montanuniversitat Leoben (AT); University of Orleans (FR); Altéo Alumina (FR); Imerys Refractory Minerals (AT); RHI-Magnesita (AT); Pyrotek Scandinavia AB (SE); Saint-Gobain (FR); TataSteel (NL); FIRE (CA); Safran (FR); University of Coimbra (PT)

Global funding

3.737.239€

UMinho funding

621.109€

Project funding period

September 1st 2017 to February 2022

Description

Refractories are heat-resistant materials used as inner linings for example for high temperature furnaces for steel or glass production. ATHOR aims at developing high-end technologies in material engineering and numerical simulations thanks to an intensive cooperation between academia, raw materials suppliers, refractory producers and end-users. Researchers take advantage of the most sophisticated tools to model, design and predict the life of different lining configurations in critical operation conditions. The European steel industry needs to dramatically reduce their production costs. This project contributes to more efficient refractory linings.

Main achievements

Several experimental campaigns were performed to obtain the thermomechanical behaviour of refractory masonry materials at different scales, ranging from the microstructure of the material up to large-scale structural elements, both at ambient temperature and high temperatures. The experimental results allow the development of advanced multiphysics constitutive models, considering the mechanical, thermal and chemical behaviour of such materials under extreme conditions. The constitutive models will be used in advanced tools to predict the behaviour of refractories in operation conditions.

Website

www.etn-athor.eu

CapBed - Engineered Capillary Beds for Successful Prevascularization of Tissue Engineering Constructs



Principal investigator / UMinho pincipal investigator Rogério Pedro Lemos de Sousa Pirraco

Research centre 3B's Research Group

Project consortium University of Minho

Global funding / UMinho funding 1.500.000 €

Project funding period November 2018 – October 2023

Description

CapBed aims at developing a new technology to fabricate in vitro capillary beds that include a vascular axis that can be anastomosed with a patient circulation. Such capillary beds will be used as prime tools to prevascularize bioartificial tissues in bioreactor systems, which will allow fast perfusion of the tissues after transplantation to a patient, ensuring their viability and function.

Main achievements

The final core team of the project was assembled with the hiring of Cláudia Gomes (MSc), Daniela Cruz-Moreira (PhD), Helena Faria (MSc) and Kátia Mesquita (PhD).



FoReCaST - Forefront research in 3D disease cancer models as in vitro screening technologies



Principal investigator / UMinho principal investigator Rui L. Reis

Research centre 3B's Research Group

Project consortium Not applicable (mono partner initiative)

Global funding 2.777.505 €

UMinho funding 2.499.754 €

Project funding period Jully 1st 2015 to June 31st 2021

Description

Cancer is the second leading cause of death worldwide and, despite many advances over recent decades, researchers dedicated to fighting the disease still face many challenges. One key issue is in the field of drug development. Around 90 % of cancer drugs that succeed in pre-clinical trials fail when they are tested in humans. The traditional pre-clinical tests simply do not provide enough accurate information on how cancers react to drugs.

The EU-funded FoReCaST project aims to provide a step change in this important area by developing highly realistic 3D tumour models that can be used to better understand the dynamic mechanisms driv-



ing cancer progression, invasion and metastasis and to predict the effect of drugs on cancer patients. The models are based on the use of biomaterials in combination with different healthy and cancer cells. Work being conducted through the project draws on the existing expertise, at 3B's Research Group, research in the fields of natural materials and tissue engineering, as well as cutting-edge technologies, such as microfluidics, bio-printing and bio-sensing.

Main achievements

FoReCaST has developed a real-time model that represents the various stages of cancer from the formation of the tumour through to its spread – or metastasis – to the organs. This breakthrough will allow researchers to tackle cancer at the very early stage of the disease and accurately monitor its progress.

In another breakthrough, the project team has identified a component of a molecule which is heavily present in breast cancer patients. The results could be used to identify people who are most vulnerable to the disease. In addition, a type of stem cell has been identified which acts as a 'double agent' by contributing to the spread of cancer while stopping its initial appearance in the body.

FoReCaST is also using advanced tumour models based on organon-a-chip technology which are providing promising results to improve understanding of tumour biology. These advanced models essentially mimic the actions of entire human organs, not just cells, and are being used as reliable drug testing platforms.

FoReCaST's 3D models will be used by pharmaceutical and biotech companies to speed up and improve the drug testing process.

Website

www.forecast.3bs.pt

Accelerating tissue engineering and personalized medicine discoveries by the integration of key enabling nanotechnologies, marine-derived biomaterials and stem cells



Principal investigator / UMinho principal investigator Rui L. Reis

Research centre 3B's Research Group

Project consortium University of Minho

Global funding / UMinho funding 3.471.402 €

Project funding period April 1st 2016 to July 2020

Description

The structured program adopts highly multidisciplinary methodologies to progress the knowledge on advanced and personalised related health technologies. The main aim is to develop new and sophisticated interventions to prevailing major health problems, in alignment with regional and national agendas, namely NORTE2020 (Tissue Engineering, Medical Devices, valorisation of marine resources) and PORTUGAL2020 (Marine Biotechnology and Exploitation of Resources, Biomaterials & Nanomedicine, Ageing). Capitalizing the installed critical mass, this Structured Program



works in the interface Health-Sciences/Technologies and biomaterials, being organized in three research lines: 1) Marine-derived biomaterials and enabling nano-based production technologies for effective healthcare devices and therapies; 2) Tissue Engineering and Personalized Medicine approaches for the regeneration of human tissues; 3) Targeting ageing-associated diseases/disorders by exploring stem cells biology and biochemistry.

Main achievements 2019

Various materials of marine origin were produced, functionalized and processed using various technologies, namely nanotechnologies, obtaining biomaterials for biomedical application. These and others are being investigated for tissue engineering and regenerative and precision medicine strategies, not only as acellular approaches, but also as systems capable of guiding the cellular response, namely with regard to the differentiation of stem cells directed to the tissues of interest. In this regard, regeneration of bone, cartilage, skin, menisci and tendons is being addressed, as well as more complex systems of interface, as is the osteochondral region - interface between bone and cartilage - and entheses - interface between bone and tendon.

A high number of scientific publications were produced, together with a noteworthy number of patent applications already submitted (including EPO). A significant number of doctoral theses were completed and 14 doctoral researchers were recruited.

Website www.3bs.uminho.pt

Tissue Engineering and Regenerative Medicine Research HUB (TERM RES-Hub) and City of Guimarães Institute



Principal investigator / UMinho principal investigator Rui L. Reis

Research centre

3B's Research Group of the PT Associate Laboratory ICVS/3Bs

Project consortium

The TERM RES-Hub consortium is constituted by the following partners: i) 3B's Research Group of the PT Associate Laboratory ICVS/3Bs of the University of Minho, ii) European Institute of Excellence on Tissue Engineering and Regenerative Medicine, EXPERTISSUES European Special Interest Group, and iii) Association for the Advancement of Tissue Engineering and Cell based Technologies & Therapies (A4TEC).

Global funding

10.799.972 € + 1.000.000 € (City of Guimarães Institute)

UMinho funding 9.523.621 € + 881.819 € (City of Guimarães Institute)

Project funding period

September 1^{nst} 2017 to September 2nd 2021 (48 months)

Description

The TERM RES-Hub is a Scientific Infrastructure that is established on the existing facilities at AvePark, Taipas-Guimarães that is based on the present building if the 3B's Research Group that resulted from the coordination of the network of excellence NoE EXPERTISSUES.



The TERM RES-Hub will be complemented with a second building, fully equipped with state-of-the-art equipment and trained human resources to operate the facility. It is the main project of the National Roadmap of Research Infrastructures of Strategic Relevance. In Association with the Municipality of Guimarães it will also host the City of Guimarães Institute of Advanced Biomedical Materials.

The main objectives of TERM RES-Hub infrastructure are to generate science of excellence and to offer services (tests, contract research and/or consulting) performed in GLP/GMO conditions and accord-ingly to ISO guidelines (3B's UMinho Q&A certification), as well as carrying out scientific projects and publishing its scientific results in high impact journals and to generate intellectual property, related to the areas of development and characterization of biomaterials, tissue engineering and regenerative medicine, medical devices and valorisation of marine resources, to the scientific, educational and business communities.

Main achievements

The TERM RES-Hub project has, so far, being able to reinforce its technical-administrative team by means of hiring different researchers and technicians. The new state-of-the art research infrastructure facility (2900 m2) and the respective acquisition of scientific equipment is now on its final stage of construction. This reinforcement will allow TERM RES-Hub infrastructure to operate based on a philosophy of four complementary pillars: i) open access, ii) training, iii) collaboration projects, iv) providing high quality services and assistance, v) have regional, national and international relevance. All equipment available at TERM RES-Hub infrastructure facilities, and the ones to be acquired in the future, can be used by internal and / or external users, following the existing (or to be created) specific rules. The TERM RES-Hub scientific infrastructure is expected to be operational in September 2021.

HIGHLY CITED RESEARCHERS

The quality and impact of scientific research are increasingly being assessed based on calculations and analyses of the number of times researchers cite each other's publications. In recent years, Portuguese Science and Scientists are appearing more and more in several scientific bodies of research.

Among these bodies, which identify researchers who demonstrated significant influence in their chosen field or fields through the publication of multiple highly cited papers during the past decade, there is one that stands out: *The Highly Cited Researchers*TM *list from Clarivate*TM.

The list recognizes world-class scientists and social scientists who have demonstrated significant influence through the publication of multiple papers, during the last decade, which rank in the top 1% by citations for field and publication year in the Web of Science, the world's largest publisher-neutral citation index and research intelligence platform.

In terms of selection methodology, the number of researchers that are selected in each field is based on the square root of the population of authors listed on the field's highly cited papers. The number of those with cross-field influence is determined by finding those who have influence equivalent to those identified in the 21 fields¹."

In the Highly Cited Researchers 2019 list of the US Clarivate Analytics, which includes 6216 scientists from almost 60 countries. The ranking covers the period from 2008 to 2018 and focuses only on highly cited articles, which represent 1% of what is published worldwide per year. In this 2019 list, which includes 23 Nobel laureates, there are also two UMinho's scientists included.



António Augusto Vicente

Research centre

Centre of Biological Engineering (Centro de Engenharia Biológica – CEB)

Main Scientific Area

Food Science and Technology

Description

Antonio Vicente is an Associate Professor with Habilitation at UMinho since April 2014, and vice-Dean of the School of Engineering of UMinho since October 2019, following his previous appointment as Head of the Department of Biological Engineering of UMinho. From an early stage of his career, he has kept close contact with the food industry and he is/has been involved in >50 research projects, both national and international, together with industrial partners both as a participant and as project leader.

His main research interests are:

micro and nanotechnology applied to Food Technology, using different structures (nano)multilayered films and coatings, (nano)emulsions, (nano)particles and (nano)gels, all from food-grade materials
 in vitro digestion system for evaluation of the fate of foods in the GI tract

food processing by ohmic heating/moderate electric fields, namely the study of the effects of electric currents on biomolecules and cells
edible films and coatings for food products (chemical, physical and functional characterization)

• bioreactor technology, including the design and operation of bioreactors for the growth of microalgae and cyanobacteria.

Main achievements

He supervised/is currently supervising 35 PhD theses; he has also supervised/is currently supervising over 70 MSc theses and 20 post-doctoral fellows. He has published over 300 research articles

in international peer-reviewed journals, 5 books, 5 patents and over 30 book chapters in international books, yielding an h-index of 54 (Scopus) and over 9800 citations. His publications are distributed across different scientific areas, being the top 10 areas shown in the figure below:



The corresponding Top 10 organizations with which his works have been published are shown in the figure below:



He is a member of evaluation panels in several EU calls and for National Research Agencies of over 15 countries around the Globe. He is also a member of the Jury of the National Agriculture Prize in Portugal, since its institution in 2012. He has been considered a Highly Cited Researcher (Clarivate Analytics) in the area of Agricultural Sciences in 2018 and 2019.



José Antonio Teixeira

Research centre

Centre of Biological Engineering (Centro de Engenharia Biológica – CEB)

Main Scientific Area

Industrial and Food Biotechnology

Description

José António Teixeira is a Full Professor at UMinho since January 2001. He started his academic career in UPorto in 1980 and moved to UMinho from UPorto, where he was Associate Professor, in 1994. At UMinho he was, for several years, Head of the Department of Biological Engineering and Head of Centre of Biological Engineering from 2012 to 2016. Currently is the Program Director of the PhD Program in Food Science and Technology and Nutrition.

He has been involved in several research projects, both national and international, several of them involving close collaboration with industrial partners.

His main research interests are focused on two main areas – industrial and food biotechnology – and include:

- bioreactors development and characterization for the production of different metabolites (bioethanol, biosurfactants, enzymes, oligosac-charides,...)

• bioreactor development for the growth of microalgae and cyanobacteria.

- process intensification using oscillatory mixing systems
- biomass processing for the sustainable production of chemicals

• application and development of innovative extraction technologies (ohmic heating/moderate electric fields and auto-hydrolysis) for the valorization of agro-food residues and by-products

• *in vitro* system for the evaluation of prebiotics and their effect on human health

Main achievements

He supervised/is currently supervising 75 PhD theses and 30 post-doctoral fellows. He has published over 600 research articles in international peer-reviewed journals, 10 books, 9 patents and over 60 book chapters in international books, yielding an *h*-index of 67 (Scopus) and over 19400 citations. His publications are distributed across different scientific areas, being the top 10 areas shown in the figure below:



The corresponding Top 10 organizations with which his works have been published are shown in the figure below:



He is a member of several evaluation panels for national and international research agencies around the globe. Currently, he is president of the scientific council of PortugalFoods, the largest Portuguese food cluster, represents UMinho in the Administration Board of Colab4Food, a collaborative laboratory for the food industry and was President of the Portuguese Biotech Society for 10 years. He received the Stimulus to Excellence from FCT and Seeds of Science awards and the Scientific Merit Award from UMinho. He has been considered a Highly Cited Researcher (Clarivate Analytics) in the area of Agricultural Sciences in 2018 and 2019.


Miguel Ângelo Cerqueira

Research centre

Univ Minho, Ctr Biol Engn

Main Scientific Area

Industrial and Food Biotechnology

Description

Miguel Ângelo Parente Ribeiro Cerqueira is a Staff Researcher at the International Iberian Nanotechnology Laboratory since March 2016. He started his academic career in UMinho in 2000 where he finished in 2010 the PhD in Chemical and Biological Engineering. He received three scholar merit awards during graduation, and his PhD thesis was awarded for the best PhD Thesis by the School of Engineering of UMinho. From 2011 to 2016 he worked at the Department of Biological Engineering as Invited Assistant Professor and in the Centre of Biological Engineering as Postdoc Researcher. He has been involved in several research projects, both national and international, several of them involving a close collaboration with industrial partners.

His main research interests are focused on three main areas – Food Science and Technology, Biomaterials and Nanotechnology – and include:

- Edible films and coatings;
- Sustainable, active and intelligent packaging;

• Encapsulation by micro and nanosystems (emulsions, particles, capsules, hydrogels);

• Oleogels and bigels;

• New processing technologies (electrohydrodynamic processing, ultrasonic atomization, nanospray dryer and ultrasounds).

Main achievements

He supervised/is currently supervising 5 PhD theses and 1 post-doctoral fellow. He has published over 110 research articles in international peer-reviewed journals, 3 books, 2 patents and over 20 book chapters in international books, yielding an h-index of 35 (Scopus) and over 4000 citations. His publications are distributed across different scientific areas, being the top 10 areas shown in the figure below:



The corresponding Top 10 organizations with which his works have been published are shown in the figure below:



He has been involved in entrepreneurship activities, in 2013 he co-founded Improveat (UM Spin-off). In 2014 he won the Young Scientist Award and, in 2016 was selected as Inaugural Member of the International Academy of Food Science and Technology Early Career Scientist Section, both organized by the International Union of Food Science and Technology. He has been considered a Highly Cited Researcher (Clarivate Analytics) in the area of Agricultural Sciences in 2018 and 2019.



COLLABORATIVE LABORATORIES *Collaborative Laboratories* (CoLABs) are non-profit private associations or companies aiming at an enriched model of R&D cooperation between private or public institutions and non-corporate R&I organizations, namely higher education institutions (through their R&D Units), technological interface centres and other intermediate or interface institutions.

In terms of composition, CoLABs must consist of at least one company and one R&D unit associated with a higher education institution, funded by FCT, I.P., and may result from a technology interface center that already has this partnership structure. In the case of R&D units without legal personality, the participating entity is the institution with legal personality in which such units are integrated.

The creation of CoLABs is supported within the scope of the Interface Programme, aiming at, directly and indirectly, creating qualified employment and scientific employment in Portugal through the implementation of research and innovation agendas aimed at the creation of economic and social value. Furthermore, CoLABs must meet the challenge of enhancing the density of knowledge-based activities in the country by fostering the consolidation of collaborative practices between scientific, technological or higher education institutions and the social and economic fabric, namely businesses, the hospital and health care system, cultural institutions, and social organizations. In the end of 2019 there were 26 CoLABs in Portugal operating in a wide range of strategic areas, including health, energy, digital transformation and food-related areas. These CoLAB structures are distributed throughout the national territory, including over 200 partner entities. Among these partner entities, about 35% are SMEs and more than 15% are large companies. R&D units represent more than 40% of CoLAB members.

In terms of economic figures, the National Innovation Agency (ANI) estimated that public investment in the CoLABs would approach the 100 million €uro figure in the first five years' period, and will be responsible for the creation of more than 500 qualified jobs.

In 2018, a first CoLAB of UMinho started its operation – DTX, founded on May 2018 with the clear purpose of leading the digital transformation in the organizations, processes and competences in Portugal, directly involving their associates to that purpose. In 2019, UMinho was participating in 5 others, playing the role of host institution in two of them - DTx and ProChild - and assuring the scientific coordination in CoLab4Food.

COLAB DTX COLLABORATIVE LABORATORY ON DIGITAL TRANSFORMATION

About DTx

The Digital Transformation Collaborative Laboratory (**DTx**-CoLab) is a non-profit private association, officially founded on the 10th of May, 2018. The launch event took place on the 30th of May, 2018, with the presence of the Portuguese Prime Minister and the German Canceler, Angela Merkel.



DTx is a large-scale partnership for applied research in different areas of digital transformation and has 18 members: 3 universities – Universidade do Minho (UMinho), Universidade de Évora (UÉvora) and Universidade Católica Portuguesa (UCatólica); 1 international laboratory - International Nanotechnology Laboratory (INL); 1 engineering and innovation centre - Centro de Engenharia e Desenvolvimento de Produto (CEiiA); and 13 companies - Accenture Technology Solutions (Accenture); Bosch Car Multimédia Portugal (Bosch); Cachapuz / Bilanciai Group (Cachapuz); Celoplás, Plastics Industry (Celoplás); DSTgroup (dstgroup); Embraer Portugal (Embraer); IKEA Industry Portugal (IKEA); Mobileum (Mobileum), Neadvance Machine Vision (Neadvance); NOS Inovação (NOS); Primavera, Business Software Solutions (Primavera); Simoldes Plásticos (**Simoldes**); Tecidos Plastificados e Outros Revestimentos para a Indústria Automóvel (**TMG**); and 2 affiliated members - Centro de Computação Gráfica (**CCG**) and Pólo de Inovação em Engenharia de Polímeros (**PIEP**).

The DTx activities are carried out in its three centres: at UMinho, headquartered at Azurém Campus (Guimarães), and in Matosinhos and Évora.

Mission and vision

The DTx mission is to develop innovative solutions for digital transformation, fostered by knowledge and creativity, and to meet the needs of its associates and society, by creating economic and social value, including qualified employment.

The vision behind the activity of this CoLab is to become a reference partner for its associates and a European player in the field of innovation in digital transformation, through knowledge, expertise, quality and passion for the development of cyber-physical systems and other solutions.

Strategy

DTx works on the intersection of physical, digital and cybernetic domains to create the next generation of advanced cyber-physical systems that are capable of blurring the boundaries between the real and the virtual world, as schematically presented in the figure. Vertical integration (digital axis) is the intersection between the physical and digital fields, representing the interconnection of material things with the internet, and requires the smart articulation and the scanning of business units.

Horizontal integration (cybernetic axis) is the intersection between the digital and the cybernetic fields, representing the systems interconnection in value chains. The horizontal integration between the organisations is important to create added value, enriching the product cycle of life with an efficient information system, financial management and logistics.

Horizontal and vertical integration allows data sharing in real time, higher productivity in the allocation of resources, more functional business units and accurate planning.

The seamless integration (physical axis) is the intersection between the cybernetic and the physical domains, representing the interconnection of the virtual twins (digital twins) with material things.

Main R&D activities

New holistic approaches to cyber-physical systems (CPS) to create, study and implement new methods for the conception and development of CPS that are capable of integrating transdisciplinary perspectives (engineering of systems thinking), combined with creative thinking (design thinking), complexity and multidisciplinary knowl-



edge, in the promotion of open innovation and its sustainability in the creation of products, services and interfaces in cyber-physical technologies.

New methods of assessing the creation of value, involving multidimensional approaches (economic, environmental, social,...) to assess the value for the different stakeholders involved in the production and use of cyber-physic systems.

Assessing the economic, social and legal impacts arising from the digital transformation processes in the industrial and organisational fields. Digital ecology efficiency, including the assessment of the behaviours and organisational cultures enabled by CPS, distinguishing individual, organisational and inter-organisational levels. Promoting the cooperation between academy and industry through the research applied to processes of digital transformation of industry and society.



Some figures

In 2019, DTx developed its first initiatives: it launched 4 prospective projects (projects in key areas, involving all the partners under an open innovation approach), 11 specific projects (to meet the objectives of a group of partners, under intellectual property protection), 1 competitive project and submitted several applications to national and European programmes with different partnerships. The recruitment of high-skilled workforce took place as planned, reaching 50 staff members in 2020.

Website

www.dtx-colab.pt





B2E ASSOCIAÇÃO PARA A BIOECONOMIA AZUL - LABORATÓRIO COLABORATIVO

CoLab coordinator

Luísa Valente, U.Porto e CIIMAR – Investigadora Responsável António Isidoro, Soja de Portugal – Presidente da Direção da Associação sem fins lucrativos que corporiza o CoLAB

UMinho coordinator

Tiago H. Silva

Project consortium

Sorgal – Sociedade de Óleos e Rações S.A. ; Savinor – Sociedade Avícola do Norte S.A. ; Sonae MC – Serviços Partilhados, S.A. ; A2O – Água, Ambiente e Organização Ld.^a ; Sparos, I&D, Nutrição em Aquacultura Ld.^a ; Ingredient Odyssey Ld.^a ; Safistela – Sustainable Aqua Farming Investments S.A. ; CIIMAR – Centro Interdisciplinar de Investigação Marinha e Ambiental ; Universidade de Aveiro - Centro de Estudos do Ambiente e do Mar ; Universidade do Minho - ICVS/3Bs -Laboratório Associado ; Universidade do Porto ; INESC TEC – Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência; Fórum Oceano – Associação da Economia do Mar.

Funding awarded

19.500 € (proveniente de quotizações e joias dos associados)

Starting date

Fevereiro 2019

Mission and vision

B2E aims to stimulate the active participation of national scientific, business and public communities in the analysis and solution of complex problems related to the sustainable use of marine biological resources. It will promote the creation of qualified jobs, actively contributing to increase the economic and social value of products



and services associated to new uses and valorization of those resources, including internationalization of scientific and technological capacity.

Description

The Association for the Blue Economy – B2E pursues the definition and implementation of research and technology transfer agendas, promoting economic and social development in two of the Blue Growth sectors with highest potential: Biotechnology and Aquaculture. Under the motto "Inspired by the Ocean - Driven by the Market -Powered by Knowledge, B2E realizes its mission by launching mobilizing projects on a national or global scale, promoting collaboration between knowledge centers and companies, encouraging the sharing of knowledge between Associates, supporting the integration in international networks and access to the global market, supporting applications for public structural funds and European calls, as well as carrying out promotional activities with national and international investors. These activities are being developed under the scope of 3 thematic areas: 1) valorization of marine biological resources, 2) marine biotechnology, 3) sustainable aquaculture.

Main achievements

The non-profit association constituting the B2E CoLAB was formalized in February 2019, enabling the start of operation. Together with the establishment of the governing bodies, B2E was installed at UP-TEC Mar in Matosinhos, under the patronage of the local municipality, and the direction elaborated an application for funding (under PT2020) envisaging the recruitment of highly qualified human resources. The first recruitment processes were initiated, targeting the selection of the Technical-Scientific Director and Innovation Technician, who should be hired at the beginning of 2020. The corporative image of B2E was developed, with the creation of logo, registration of web domain and set-up of official contacts and social network accounts. The technical work was initiated, by starting the design of a research agenda, with contributions from the associates, under the established 3 thematic lines.

Website

www.b2e.pt





COLAB4FOOD LABORATÓRIO COLABORATIVO PARA A INOVAÇÃO DA INDÚSTRIA AGROALIMENTAR

CoLab director

Miguel Teixeira

UMinho coordinator

José António Couto Teixeira

Project consortium

Indústria: Associação Integralar – Intervenção de Excelência no Setor Agro-Alimentar; Super Bock Bebidas, S.A.; Grupo Primor, S.A.; Sumol + Compal Marcas, S.A.; Frulact - Indústria Agro-alimentar, S.A.; Mendes Gonçalves, S.A.; Sense Test - Sociedade de estudos de análise sensorial a produtos alimentares, Lda. **Sistema Científico Nacional:** Instituto Nacional de Investigação Agrária e Veterinária, I.P.; Requimte – Rede de Química e de Tecnologia; Universidade Católica Portuguesa; Universidade de Aveiro; Universidade de Lisboa - Instituto Superior de Agronomia; Universidade do Minho; Universidade do Porto; Universidade de Trás-os-Montes e Alto Douro; Instituto Politécnico de Viana do Castelo – CISAS; Universidade de Coimbra.

Funding awarded

1.500.000€

Starting date

March 2020

Our Vision

Our vision 2025 is built on the responsibility to be an institution that privileges innovating first by being a Collaborative Laboratory that connects resources (human knowledge and laboratory technologies) and different entities to face industry needs and challenges. Colab4Food's vision is supported on 5 strategic pillars:



a) Driving sustainable innovation through R&D projects,

b) Unlocking growth opportunities in competitive funding calls and networking activities,

c) Acceleration value-2-market with differentiated services,

d) Customer and consumer focus for efficient knowledge transfer,

e) High performance talent to convert critical mass into technological solutions.

Ultimately, we aim to become the key-platform for collaborative innovation & knowledge transfer in the national agri-food sector representing Portugal in the innovation ecosystem.

Our mission

Our purpose is to redefine the way we innovate collaboratively for a sustainable growth of the food sector and that of our associates, in particular. Throughout this process, Colab4Food will act as the strategic entity to bridge industry and academia, thus being a driving force in future innovation for the food industry needs and consumer demand through knowledge and partnership-based research. Together we will develop more sustainable food processes, nutritive foods and tailored solutions for our customers that will improve their consumers delight, health and well-being. Furthermore, we will actively contribute to promoting the internationalization of the Portuguese food companies by identifying research funding opportunities and empowering the food business with the latest technology tools and processes.

Description

Colab4Food is a new entity in the Research & Innovation (R&I) food sector with the clear purpose to redefine the way we innovate, modernize and improve it in a collaborative way for a sustainable growth of our associates. Colab4Food will combine expertise and creativity to develop more sustainable food processes, innovative nutritive foods and tailored taste solutions for our associates that will enhance their consumers delight, health and well-being. Ultimately, we will, together, strengthen the R&I footprint and the competitiveness of the food sector. "Innovating First – A Catalyst for new Discoveries" is our moto for the first triennium where we want to develop fast and applied innovative food solutions while we operate within the food sector matrix by connecting different scientific entities with industrial partners' needs. Colab4Food has a team of 17 highly gualified researchers and its headquarters are located at Instituto Nacional de Investigação Agrária e Veterinária - INIAV, IP, in the Campus of Vairão, Vila do Conde (Portugal).

Main achievements

Colab4Food was awarded the CoLAB grant and funding for starting its own operations.

Website

www.colab4food.com





PROCHILD COLAB PROCHILD AGAINST AND SOCIAL EXCLUSION - ASSOCIATION

CoLab coordinator Isabel Maria da Costa Soares

UMinho coordinator

Isabel Maria da Costa Soares

Project consortium

University of Minho (UMINHO) University of Porto (UP) University of Aveiro (UA) University of Coimbra (UC) Centre for Social Studies of University of Coimbra (CES) Faculty of Psychology – University of Lisbon (FP-UL) Lisbon School of Economics and Management (ISEG) Portuguese Catholic University (UCP) Center for Computer Graphics (CCG) Municipality of Guimarães (CMG) SONAE Corporate (SONAE) Irmãos Rodrigues (IRodrigues) DST Group Santa Casa da Misericórdia de Lisboa (SCML) Vasco Vieira de Almeida Foundation (FVdA)

Funding awarded

N2020 RHAQ: 1 943 480.74€ + 20% FCT

Starting date

Date of Establishment: 2019-01-09 Activity start date: 11-04-2019

Mission and vision

Mission: To develop a national strategy to combat poverty and social exclusion in childhood, framed in a transdisciplinary scientific approach that articulates the public and private sectors.

Vision: To be the Portuguese institution of reference in offering transdisciplinary and integrated interventions to break the cycle of poverty and promote the well-being and rights of children, trough the accomplishment of several goals.

Description

ProChild CoLAB aims to combat poverty and social exclusion in childhood, based on a multidisciplinary scientific approach trough two major areas: Social Intervention and Technological Development. The first includes four strategic pillars, each with specific projects, implemented in specific territories: (1) Health and Well-being; (2) Development and Education; (3) Social Participation, Citizenship and Gender Equality; (4) Protection from Violence, Exploitation, Abuse and Neglect. These pillars are linked to the Technological Development area, in the fields of Digital Technology and Nanotechnology. The alliance between social intervention and technological innovation will translate not only into the production of scientific knowledge, but also in the construction and dissemination of intervention programs and technological products that respond to the needs of children, families, professionals and institutions. The development and validation of technological programs and tools focused on children, will enable dissemination in (inter)national territory.

Main achievements

ProChild CoLAB is divided into two main thematic areas: Social Intervention and Technological Development that work synergistically with each other. During 2019, ProChild CoLAB concentrated its main activities on the recruitment of Highly Qualified Human Resources, which began with the first hiring at the operational level of the technical team in mid-November 2019, so the activities carried out had a greater impact later in 2020.

In 2019, there was an important work of initial characterization of the territory of the Municipality of Guimarães and, more specifically, of the learning field. In this sense, innumerable meetings and articulations were initiated with the teams of the local entities of the Municipality of Guimarães to know and document the scope of their work, as well as their resources, potentialities, difficulties and obstacles. There was an important collaboration work with the same objectives with Santa Casa da Misericórdia de Lisboa.

Website

www.prochildcolab.pt





INTERFACE UNITS

According to our Statutes, UMinho has as its main mission to generate, disseminate and apply knowledge, based on freedom of thought and the plurality of critical exercises, promoting higher education and contributing to the construction of a model of society based on humanistic principles, with knowledge, creativity and innovation as factors of growth, sustainable development, well-being and solidarity.

In the last decade there has been an enormous increase in the number of research deals between universities and general society, including private and public companies, health care providers, cultural players etc. In this particular, UMinho is being increasingly known to play a major role in regional innovation, by interacting directly with regional stakeholders. This process has resulted in an increased intensity of university-society knowledge transfer, but competitive forces in the knowledge economy are accelerating innovation activities and the need for universities to perform the role of important contributors for real economies.

Beyond the "simple" research and innovation developers and providers, Universities are increasingly expected to engage in regional innovation policy. This has reinforced the need for an organization change in the university structure to respond to these new challenges. This need for change in the typical knowledge transfer structures resulted in the appearing of the so-called strategic interface units. These units are multidisciplinary and cluster-like formal networks led or participated by universities in collaboration with businesses, government authorities and other organizations. These interface units, typically of private non-profit associations type, cooperatives of limited liability public interest or foundations, were created to support the alignment of the universities with the needs of society and its development.

The scope of activity of these interface units typically involves actions in the fields of development, production and transaction of products and services, development of R&D projects, specialized training, management and exploration of science and technology parks, entrepreneurship and business incubation, promotion and dissemination of cultural activities, promotion of regional development, among others. In fact the Interface Units of the University are key players in the regional research and innovation ecosystem as evidenced in a recent study conducted by EUA (European University Association) while stating the central role of the University of Minho in that respect.

In 2019, UMinho interface units were engaged in more than 220 research projects, involving more than 200 researchers and technical staff, which together total about 12 million euros financing. Beyond these economic-based figures, it should also stand out from the activities of the interfaces in which UMinho participates, the organization and promotion of cultural events, such as conferences, exhibitions or concerts.

UMinho's participation in these interface entities is distinguished by the scope of its activities and also by the depth of its links with UMinho's schools/institutes, namely with respect to the number of projects and their size, as well as the number of researchers involved. The importance of strategic affiliates for the fulfillment of UMinho's mission is reflected in the holding of significant percentages in the entities' equity funds and in active participation in their governing bodies, namely at the management level.

Inter-institutional collaboration through network-like arrangements is not only become a growing theme in the academic and political discourse, but a strong commitment of UMinho with the region and the overall society. As part of its policy of valorization of knowledge resulting from its scientific and technological research activities, UMinho promotes and encourages the entrepreneurial initiatives of its researchers using several instruments, among which the UMinho Spin-off is one of the most recognized. The UMinho Spin-off brand represents the translation of knowledge generated within the University of Minho, through the exercise of an economic activity with high growth potential. It is granted primarily to projects linked to Research Centers, aimed at creating companies able to value research results generated in the course of scientific activities conducted by the academic community, such as research fellows and researchers.

CENTRE FOR COMPUTER GRAPHICS





CCG/ZGDV - Centre for Computer Graphics association (CCG) was founded in 1993 as a private and non-profit organization, and was established at the University of Minho in 2001.

CCG is qualified by the National Scientific and Technological System and is recognized by the Portuguese Government as a Technological Interface Centre for the digital economy, counting on the support of 2 Associate Constituents: University of Minho and FEHST S.A., as well as 21 members from the business and associative sector. The strategic objectives of CCG are:

1. To promote "innovation" in the organisations and collaborate in its "endogenization"; 2. To adapt new "technologies" to the needs of organisations and their businesses; 3. To boost the competitiveness of companies, collaborating in the development of new products and services.

CCG's intervention favours the "Demand Pull" approach, by focusing on R&D projects that address market demand. It has a proactive stance, identifying research challenges that can foster innovation and increase the competitiveness of end users (companies and entities). Additionally, it defines innovation goals and the lines of fundamental research that support state-of-art technologies.

CCG is organized into four Departments named as "Domains of Applied Research", corresponding to operational units, each with its own multidisciplinary structure. Each unit is specialized in the scientific field in which it operates and in the value proposition of the technologies it develops. CCG's Domains of Applied Research have several projects in their corresponding areas, collaborating closely with the ALGORITMI Centre of University of Minho, namely with the engageLab, SEMAG, IDS, EHF and Ubicomp Groups.

CCG acts on a national and international level, autonomously or collaboratively, positioning itself as an interface between the sources of knowledge (Universities) and the economy (Companies), based on strategic partnerships - via projects and services - with the transfer of knowledge and technology at its core. Chairman of the Board of Directors

Luís Alfredo Martins do Amaral

Administrator

Ricardo Jorge Silvério Magalhães Machado

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🛉 Staff

PhD	9
MsC	29
Licentiate	21
Attending university	1
Secondary education	6
Total members	66

Departments/areas of intervention

R&D+i Department - CVIG: Computer Vision, Interaction and Graphics	CVIG's department develops activities of R&D+i on the following areas: Pattern detection, recognition, and tracking • Artificial intelligence • Electronic surveillance • Medical Image Analysis • Industrial Applications (metrology, defect detection, etc.) • Assistance and remote collaboration with mixed/ augmented reality. • Virtual assistants (avatars) • Extended Reality (Augmented/Mixed/Virtual) • Visual analytics • Gamification
R&D+i Department - EPMQ: IT Engineering Process Maturity and Quality	EPMQ's department develops activities of R&D+i on the following areas: • Information Systems Engineering • Software Process • Prototyping and Producing Software and Services • Project Management of Information Systems • Software Systems Architectures • Cloud Computing • Edge Compu- ting • Fog Computing • Internet of Things (IoT) • Blockchain• Service-Oriented Architecture • Data Architecture • SQL and NoSQL databases • Data Warehousing • Big Data • Open Data • Decision Support Systems • Business Analytics • Data Mining • Artificial Intelligence • Machine Learning.
R&D+i Department - PIU: Perception, Interaction and Usability	PIU's department develops activities of R&D+i on the following areas:• Human factors and road safety • Usability • Human-computer interaction • Visual perception and auditory perception • Intermodal processes (visual, audio, haptic, proprioception) • Virtual reality and immersive systems • Binaural sound and auralization models • Biological movement • Serious games • Market services
R&D+i Department - UMC: Urban and Mobile Computing	UMC's department develops activities of R&D+i on the following areas:• Data collection and merging • E-Ticketing • Urban intelligence • Sensor sys- tems and network • Sustainable and intelligent mobility • Mobile and vehicle network communications • Smart parking • Public displays • Behavioral fingerprinting • Cooperative ITS • Real-time location systems (RTLS) - indoors & outdoors• Place learning • Knowledge discovery in geographical data
Infrastructures Department	CCG's Infrastructures Department focus on administration and management of essential operational elements to effectively, efficiently, and proactively utilize technology, information, and data. These elements include the computers, servers, networking, data, storage, physical and virtual facilities as well as software, processes, policies, security, mobile and virtual functionality, and cloud-based services that make up the IT infrastructure.
Marketing and Communication Department	CCG's Marketing and Communication Department focus on the planning, implementation, coordination and monitoring of strategic actions, which promotes the image and the institutional notoriety. The main activities include MKT and Communication Plan; institutional channels and social media networks; branding and design; online and offline contents; press office; events; reportings and clipping of the communication portfolio.
Internationalization Department	The main mission is to support the implementation of the CCG's internationalization strategy, promoting activities such as: application for projects in International Consortium (H2020,); participation and interaction in international networks of R&D centres (GraphicsMedia.Net,); participation in the activities of ETPs supported by the EC (NESSI, NEM,); monitoring of tenders and service opportunities outside of Portugal; contributions to international standardization boards (ISO,)
Administrative & Financial Department	CCG's Administrative and Financial Department comprises the following areas: accounting, treasury management, and planning, management control, human resources management, project financial management, administrative and financial support for funded project applications, insurance mana- gement, bank credits, leasings and renting and support for the organization of events.



Research projects

National Funding	Number	Total funding
Portugal 2020 Programme	20	3.945.673 €
Others	-	-
Total	20	3.945.673 €
International Funding	Number	Total funding
European	3	478.609€
Others	-	-
Total	3	478.609€
Total (National + International)	23	4.424.283€

Major achievements

Flagship projects



Texboost - less Commodities more Specialities

The TexBoost is a structuring project of the Textile Cluster: Technology and Fashion, which aims to include a set of R&D initiatives with a strong collective character and high inductor and demonstrator effect, with the central involvement of companies of the textile and clothing sector, but also of other complementary sectors of the economy. Project website: www.texboost.pt



Product in Touch - Development and Industrial Validation of a Multimodal Virtual Prototyping for In-Car Design

The project aims to develop a solution that will allow obtaining a standardization of the tactile sensation in a virtual environment to improve design, quality and manufacturing process in the injection molding of plastic components used in car interiors.



AR WARE: Augmented Reality for intelligent WAREhouse management

The project aims to build a platform to support the organization, management and improvement of the efficiency of logistics operations and picking in medium and large warehouses, based on paradigms such as IoT, 4.0 Industry and technologies such as augmented reality, indoor location and intelligent algorithms.

Governance of important institutions



Standardization Organisation (ISO)

Portuguese Delegate Expert at - Ergonomics in Road Vehicles. By Indication of the IPQ, CCG is the Portuguese member in the subcommittee of Ergonomics in Road Vehicles for the International CCG contributes with its know-how to the definition of international standards applicable to everyday life regarding automotive ergonomics and autonomous driving.



Member of the Technical Commissions for Standardization

The CCG is part of three Technical Commissions for Standardization, namely "CT 103 - Two Wheel Vehicles" - standardization in the field of two-wheeled vehicles, with or without a motor and accessories; "CT 196 - Electronic Invoice" - monitoring of works on dematerialization of documents and electronic invoices, carried out at European level and "CT 199 - Information Systems for Health" regarding Health Information and Communication Technologies and Systems.



Cofounder and member of GraphicsVision.AI

GraphicsVision.AI, a not-profit international network (www.graphicsvision.ai).The members of GraphicsVision.AI are international research institutions and innovation driven companies that share a common vision and interest in technologies like Computer Graphics, Multimodal-Multimedia, Visual Interactive Digital Media, Visualization and Simulation.

INNOVATION IN POLYMER ENGINEERING





PIEP is a private non-profit research and development organization providing consultancy, materials development, product and processing technology development, as well as testing services for the polymer industry worldwide and related sectors.

Established in 2001 by some of the leading national plastic companies, the University of Minho and with national government support through IAPMEI, PIEP holds a wide range of associated members, the majority plastic industry affiliates (plastics converters, machinery suppliers, mould making companies, compounders and material suppliers). Based in Guimarães (Portugal) and strategically located in the University of Minho Campus, close to the Department of Polymer Engineering, PIEP currently employs over 30 people with relevant academic background and applied R&D experience in a wide range of polymer science and engineering domains. Its 3,000 sq meter state-of-the-art facilities (an investment over 6.5 mil-

lion Euros from private and public sector) provides extensive capabilities for polymer characterization and testing (mechanical, thermal, rheological, chemical and thermo-physical), thermoplastics processing (conventional and multi-material injection molding, single and twin screw extrusion, co-extrusion, blow molding, thermoforming), thermoset processing (vacuum infusion, RTM) and advanced computational modelling tools for product engineering (processing and mechanical performance modelling).

Commitment to industry: PIEP, in cooperation of the academic staff from the Department of Polymer Engineering of the University of Minho, provides research with up to date scientific knowledge, ensuring the best and innovative problem-solving approaches to industry's innovation challenges and needs.

Our mission: To be a European leading research and development organization in the field of polymer engineering, ensuring an effective response to the R&D needs of its associates and clients, based on differentiated knowledge in strategic technology areas, by materializing the vocation of know-how development and turning ideas into products in close collaboration with industry.

Relevant skills/experience: With its core knowledge and competencies based on materials science – engineering - processing technologies, PIEP is actively engaged in the development of research projects for companies worldwide and for different application sectors (automotive, packaging, building & construction, consumer electronics, health & care, aeronautics and defence, energy and white good markets).

Turning ideas into successful products remains PIEP's slogan since the start. MATERIALS: Formulation development and optimization; Biodegradable polymers; Nanomaterials; Conductive polymers; Special applications; Recycling PRODUCT ENGINEERING: Concept development; Advanced computational modelling and simulation; Process modelling and optimization; Conceptualization of production tools

POLYMERS AND COMPOSITES PROCESSING: Compounding; Extrusion; Injection moulding; Composites processing technologies; Decoration and finishing techniques; Other processing technologies

PRODUCT CHARACTERIZATION AND TESTING: Our plastics and polymers laboratories provide services to global industries where polymers, plastics and composites are used, supporting research and development, quality control, quality assurance, production, compliance, marketing, technical and customer services. PIEP Materials Testing capability include Analytical Services, Mechanical Testing, Optical Testing, Rheology of Polymers, Weathering Ageing Testing, Thermal Analyses, Microscopy Services, Failure Analyses, Polymer Chemistry **President of Administration Board** Nuno Guimarães

Managing Director Carlos Ribeiro

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Departments/areas of intervention

Testing Area	PIEP offers testing services to help ensure the quality of materials, products and processes of the plastic industry. Combining different analysis techniques, PIEP can identify unknown materials, verify specification compliance, prepare technical data sheets and determine causes of failures.
Engineering Area	PIEP engineering supports companies developing innovative products and processes. Using over 80 years of accumulated experience, design competences, experimental testing and advanced computing tools, we can participate in all phases of development process, converting ideas into successful products.
Injection Moulding Area	Based on a strong academic & industrial innovation activity, Injection Moulding Area contributes to strength the competiti- veness of the plastics & mold industry and foster an R&D culture by providing the professional experience, process compu- ting simulation, physical infrastructure and technical information.
Extrusion Area	The extrusion department is a scientific-technological team that is based on a group of talented people with expertise in chemistry, polymer and materials engineering, and that establishes a solid support to the industry in the development of new high-performance thermoplastic based-materials by means of extrusion compounding.
Composites Area	The Composites Area has capabilities for R&D projects, Innovation and Technology Transfer, Advanced Training, Consultancy and Manufacturing. The activity focus is in aerospace and defence. Manufacturing capabilities: Vacuum Infusion, Filament Winding, Resin Transfer Moulding, Prepreg (OOA), Forming, etc. Manufacturing materials: Carbon, Aramid and Glass Fibres, with Thermoset and Thermoplastic Matrix.
Circular Economy Area	We assist companies in designing products in such a way that they can easily be reused, and we also transform waste into quality secondary raw materials. PIEP is committed to the transition of plastics to a circular economy and, with our expertise in Life Cycle Assessment (LCA) and Life Cycle Costing (LCC), we examine the entire value chain, modelling different scenarios to evaluate different aspects of sustainability from CO2 emissions and material use to health and economic feasibility.



†† Staff

PhD	4
MsC	17
Graduated	12
Technical Staff	2
Total members	35

Research projects

National Funding	Number	Total funding
Portugal 2020 Programme	22	534.521€
Others	1	296.114€
Total	23	830.636€
International Funding	Number	Total funding
European	1	196.567€
Others	-	-
Total	1	196.567€
Total	24	1.027.203 €

(National + International)

Туре	Number
International meetings organization	1
National patents submitted	1

Major achievements

Flagship projects



Senior Inclusive

Senior Inclusive - The Senior Inclusive Project focused on creating a product capable of responding to the need to monitor and accompany senior citizens who live alone or spend part of their day alone, transporting the adaptation and features present in the products already available to users' homes by the company Hidepixel.

The result was a device made up of a Tablet + Wearable + Dock station, adapted to the hardware level with inclusive design and software customized according to the profile of the elderly. The devices allow you to carry out activities such as voice and video calls, replacing the telephone, interconnecting with devices for measuring health parameters, real-time location, and detection of falls, which can save lives in emergencies. The system also integrates an online platform where family members and professionals can access all data in real-time.



Eco Sustainable Rail

Eco Sustainable Rail - The Eco Sustainable Rail project had as its main objective the valorization of mixed plastics in the development of sustainable railroad sleepers, in a clear innovative approach to the circular economy and industrial symbiosis. The developed product adds an answer to the challenges of the circularity of plastics and to the present and future of a more sustainable railroad.



TECH TRANSFER

TECH TRANSFER - TECH TRANSFER is a project that in the face of the challenges that the world has been facing, from the transition from a linear economy to a circular economy until the 4th industrial revolution, aims to contribute to leveraging the transfer of scientific and technological knowledge in the area of plastics for industry and society and promote the emergence of new solutions, more sustainable, innovative and intelligent, that respond to the needs of the industrial fabric and that contribute to this societal transformation.

Prizes, Awards, Nominations

Recognition as a Technological Interface Centre by ANI

PIEP is recognized as a Technological Interface Centre by the National Innovation Agency, S. A. (ANI), in the fields of Production Technologies, Materials Technologies, Mechanical Engineering and Environment | Quality | Security | Metrology.



Governance of important institutions



Member of APIP - Portuguese Association of the Plastic Industry

PIEP becomes member of APIP - Portuguese Association of the Plastics Industry. APIP is a non-profit organization, being the reference association of the plastics sector in Portugal.

CENTRO PARA A VALORIZAÇÃO DE RESÍDUOS





CVR is a private, non-profit association, created in 2002, whose founding members are: Minho Industrial Association, Portuguese Foundry Association, TecMinho and UMinho. UMinho is the main shareholder of CVR within its 83 associates with 56% of the share. CVR has associates from several different fields of activity, namely: waste managers, public entities, institutions of the scientific and technological national system and companies from the foundry. metalworking, ceramics, paper and agri-food industries. CVR is a technological interface that bonds Knowledge and Market through applied research and technological development in fields related to waste incorporation in civil construction, recovery of metals from waste, biological treatment processes, waste-to-energy processes, material recovery from animal by-products, biofuels production and life cycle assessment. CVR has its own headquarters (2000m2 of laboratorial area) located in the Campus of Azurém of UMinho. CVR has organised, since 2011, the International Conference "Wastes: Solutions, Treatments and Opportunities", which, in its five previous editions, gathered 1220 Participants from 26 Countries doing a total of 15 Plenary Lectures, 580 Oral Presentations and 319 Posters. CVR has developed its business in the area of technology transfer and applied research at a local, regional and international level, throughout the participation in several projects and partnerships around the globe. CVR is honoured to be founding member of the Clusters SMART WASTE PORTUGAL and CENTROHABITAT. The Centre obtained recognition of Public Utility by Dispatch N. 9161/2017, of October 18, 2017, signed by the Portuguese Minister of the Presidency and of the Administrative Modernization and recognition as Interface Centre by Dispatch N. 10252/2017, of November 24, 2017, signed by the Portuguese Minister of the Economy.

Chairman Maria Cândida Lobo Guerra Vilarinho

Executive Director Jorge Manuel Marques Granja de Araújo

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†† Staff

PhD	3
MsC	9
University degree	4
Bachelor degree	1
Technical staff	4

Total members 21

Departments/areas of intervention

D1 (LCR - Laboratory of Waste Charaterization)	The LCR - Laboratory of Waste Charaterization is an internationally accredited laboratory according to NP EN ISO/ IEC 17025 and has a highly qualified team, with technical quality and adequate academic and professional training in order to provide waste, sludge, soil, effluent or water characterization services to its customers. The main analyses carried out in the LCR are as follows: - Chemical analysis and basic classification of waste for landfilling purposes; - Classification of waste (hazardous/non-hazardous); - Characterization of refuse-derived fuels (RDF); - Characterization of construction and demolition waste (C&DW); - Characterization of sludge for deposition in agricultural soils; - Characterization of contaminated soils; - Analysis of groundwater and rainwater; - Analysis of domestic and industrial effluents; - Analysis of landfill leaching.
D2 (LEG/LAR - Gas Emissions Laboratory and Noise Assessment)	The LEG/LAR is an internationally accredited laboratory according to NP EN ISO/IEC 17025 and has a highly qualified team with technical quality and adequate academic and professional training in order to provide value-added services to its customers. In order to improve air quality, LEG/LAR- Gas Emissions Laboratory and Noise Assessment provides services in the characterization of gaseous effluents in fixed industrial sources from all types of industry (ceramics, metallurgical, textile, automotive industry and workshops, among others), in view of the legislation in force (DL 78/2004). The service provided offers the guarantee of technical and human means with quality, using the appropriate and properly calibrated equipment, as well as portuguese and European reference standards. Services: - Environmental Noise Assessment; - Evaluation of the following parameters in fixed sources: Total suspended particles (TSP); Total volatile organic compounds (VOC), VOCNM and CH4; Combustion gases: CO, NOx, CO2, O2, SO2, H2S; Fluorides and chlorides; Heavy metals; Characterization of runoff (T ^a , Pressure, speed, flow); Characterization of biogas landfills.
D3 (LMG - Laboratory of Geotechnical and Materials)	The LMG - Laboratory of Geotechnical and Materials provides services for the characterization of civil construction materials, geotechnical studies and geotechnic- -related activities. For this it has a specialized technical team with extensive experience in the construction business. Services: - Characterization of cements; - Cha- racterization of mortars; - Characterization of bituminous; - Characterization of rocks; - Characterization of aggregates in laboratory and in situ; - Characterization of soils in laboratory and in situ; - Characterization of CDW's according to Specifications LNEC E 473:2009 and E 474:2009.
D4 (IDT - Department of Research and Technological Development)	The IDT - Department of Research and Technological Development promotes and implements research and development projects, exploring potential in the de- velopment of innovative methodologies for valuing waste and evaluating its potential for transferability. For each specific situation, specific waste management options are assessed from an environmental, technical and economic point of view in order to always respect the principle that wastes are resources. The wide dissemination of the results obtained, through the publication of scientific articles in national/international arbitration journals and the creation of scientific quality debate spaces, in the format of workshops and/or conferences, should enable the transfer of knowledge between all potential users with corporate and environ- mental responsibility from the various sectors of activity. Research Areas: - Incorporation of waste as materials in civil construction; - Recovery of metal metals and metal salts from waste and effluents; - Processes of waste-to-energy; - Recycling of construction and demolition waste; - Production processes for biofuels and waste fuels; - Valorization of agro-industrial waste; - Life cycle analysis; - Integrated waste management systems. It should be noted that several of the innovative solutions and options developed in the scope of the CVR research and development area have led to the design, design and construction of prototypes, pilot facilities and equipment for validation of technological solutions and proposed treatment operational cycles, also allowing the definition and execution of layout projects of facilities for the implementation of technologies developed at the industrial scale.
D5 (DCA - Comercial and Administrative Department)	The Comercial and Administrative Department coordinates the administrative, financial and commercial activities of CVR. Aligns the commercial and trading gui- delines with the management of proposals.
D6 (DGP - Project Management Department)	The Project Management Department monitors and controls the administrative and financial execution of financed projects in the various areas of activity of the CVR, ensuring the achievement of the defined objectives.
D7 (DCI - Communication and Image Department)	• The Communication and Image Department establishes, together with the Executive Board, the communication policy of the CVR, ensuring the increase in the visibility of the institutional image of the Centre.

Research projects

National Funding	Number	Total funding
Portugal 2020 Programme	9	275.958€
Others	1	64.889€
Total	10	340.848 €
International Funding	Number	Total funding
European	-	-
Others	2	71.328 €
Total	2	71.328€
	12	412.176 €

(National + International)

Showledge transfer and interaction with society

Туре

International meetings organization

Number

6

Major achievements

Flagship projects



EGR - EcoGreenRoof

"EGR - EcoGreenRoof: Development of eco-materials for green roofs". Co-financed by the European Union through the European Regional Development Fund (ERDF), under the COMPETE 2020 Operational Program for Competitiveness and Internationalization of Portugal 2020. Location: Portugal. Consortium: NEOTURF - Construção e Manutenção de Espaços Verdes, Lda. (Lead Partner); W2V, S.A.; CVR - Centro para a Valorização de Resíduos; ITECONS - Instituto de Investigação e Desenvolvimento Tecnológico para a Construção, Energia, Ambiente e Sustentabilidade. Total eligible cost: € 684.680,29; EU financial support: € 469.994,97.



VALORMAR

"VALORMAR - Integral valorization of marine resources: potential, technological innovation and new applications". Co-financed by the European Union through the ERDF - European Regional Development Fund, under the Operational Program Competitiveness and Internationalization - Compete 2020, Lisbon Regional Operational Program, Lisbon 2020 and Algarve Regional Operational Program, Algarve 2020. Location - North. Consortium: Led by SONAE, it comprises 18 companies and 13 entities of the Portuguese R&D Network, among them the CVR - Centre for Waste Valorisation. Total eligible cost: 8 503 598,37 €; EU financial support: 5 679 831,18 €.



RENew

"RENew - Construction waste for a circular economy: from an industry intensively consuming natural resources to a competitive solution for the reintroduction of waste on a large scale". Co-financed by the European Union through the European Regional Development Fund (ERDF), under the COMPETE 2020 Operational Program for Competitiveness and Internationalization of Portugal 2020. Main goal - Reinforce research, technological development and innovation. Location - North. Consortia - Domingos da Silva Teixeira S.A. (lead partner); Universidade do Minho; Universidade de Trás-os-Montes e Alto Douro; CVR - Centro para a Valorização de Resíduos. Total eligible cost - 1.573.259,57 €; EU financial support - 926.058,05 € (ERDF).

Prizes, Awards, Nominations

Wastes: Solutions, Treatments and Opportunities

5th International Conference "Wastes: Solutions, Treatments and Opportunities" took place in September 2019, in Almada and gathered 304 participants from 17 countries, including 5 industry workshops, 4 plenary lectures, 123 oral presentations and 97 posters exhibition.



EcoCircle CVR: Towards an Efficient Circular Economy

CVR was funded with 386.003,38€ from the FITEC - Fund for Innovation, Technology and Circular Economy, Interface Program, of the Portuguese Government, for the 2018-2021 triennium. CVR developed a Strategic Action Plan (PAE-CVR) called "EcoCircle CVR: Towards an Efficient Circular Economy", based on work previously performed at the Centre.



Governance of important institutions



AEdoAVe - Energy Agency of the Ave Regiony

Member of the Board of Directors of AEdoAVe - Agência de Energia do Ave (Energy Agency of the Ave Region).

CLINIC ACADEMIC CENTRE - BRAGA, ASSOCIATION





The Clinic Academic Centre - Braga, Association (2CA-Braga), is a non-profit partnership, between UMinho, through the School of Medicine (EM) and the Life and Health Sciences Research Institute (ICVS), the Hospital of Braga, E.P.E. and Hospital CUF-Porto.

The proximity and complementarity of partners allows an integration of the different services, skills and researchers, promoting to the 2CA-Braga an ideal environment to development clinical and translation research activities. The partner Hospital of Braga supports the 2CA-Braga in services as Imaging, Pharmacy, Clinical Pathology, Pathologic Anatomy and Nuclear Medicine.

On the other hand, the EM/ICVS supports the research team in statistical analysis, methodologies and data management, as well as information and technology services.

The 2CA-BRAGA has a unique and privileged position for combining clinical research with clinical practice, maximizing the development of innovative biomaterials, diagnostic strategies, regenerative approaches and therapeutic products.

The 2CA-Braga mission is focused on clinical research, clinical care, education and training of research teams with the following objectives:

1. Implementation of an independent structure which develops a clinical and translational research of excellence;

2. Creation of a structure that enables joint participation in projects/ studies and development of innovative solutions;

3. Promoting the development of clinic research in Portugal, in city of Braga and the Minho region.

The 2CA-Braga has adequate infrastructure in terms of functionality and adjustment to the activity of providing health care and the procedures associated with the different projects in Commercial or Investigator-Driven Studies.

The infrastructure has dedicated areas for the management of the Clinical Research Unit, areas to support the participants in clinical studies and technical areas, specifically:

1. Management area (Provisioning Room; Equipment's Room; Collection and Processing Sample Room; Archive Room and Coordination Room);

2. Supporting area for the participants (Reception and Waiting Room and Refectory);

3. Technical areas (Medical Offices; Day Hospital Room; Nurse Room and Pharmacist Room).

President Nuno Sousa

Vice-President João Porfírio Oliveira

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Research projects

National Funding	Number	Total funding
Portugal 2020 Programme (Projeto UM/ICVS/EaM> 2CA-Braga)	1	1.160.746 €
Portugal 2020 Programme (2CA-Braga)	2	89.505 €
Total	3	1.250.252€
International Funding	Number	Total funding
European (2CA-Braga)	1	167.786€
Total	1	167.786€
International Clinical Trials (Pharmaceutical Industry)	Number	Total funding
International and National (2CA-Braga)	114	950.000€
Total	114	950.000€
Total	118	2.368.038€

(National + International)



Staff İ.

Medical Executive Director, PhD	1
Phase I Medical Coordinator	1
Clinical Research Manager	1
Financial Coordinator	1
Clinical Study Coordinators	5
Clinical Study Nurses	2
Clinical Study Assistant	1
Clinical Study Pharmacist	2
Clinical Study Psychologist, PhD	1
Imaging Technician	1

Total members 16

Major achievements

Flagship projects



Consolidate and Empower Clinical Research @ 2CA-Braga

This project aimed to:

• consolidate and increase the clinical research activity of 2CA-Braga, through the implementation of a Phase I Clinical Trials Unit;

• implement a Clinical Research Training Program.

Both aims were achieved and are fully operating.

LANDSCAPE LABORATORY





The Landscape Laboratory (www.labpaisagem.pt) is located at the meadow of Creixomil, in Guimarães. It aims to integrate research and development (R&D) and environmental education.

The institution acts on a multidisciplinary basis, bringing together different areas of R&D - Nature and Biodiversity, Landscape and Territory, Water Resources, Urban Environment and Circular Economy.

Landscape Laboratory intents to address challenges posed by civil society, finding innovative solutions to improve life quality. It sought to bind together the local authority's territory management experience and the knowledge provided by universities, through strong coordination with the University of Minho and the University of Trásos-Montes and Alto Douro.

It is an innovative concept that aims to reinforce the importance of cities' investment in R&D+i and the partnership between the public and private sectors.

The protection of natural heritage and water resources management are some of the Landscape Laboratory's main challenges. The institution is also in charge of developing projects for "Guimarães for Circular Economy" strategy.

The Landscape Laboratory also takes on Environmental Education as one of its strongest pillars by providing the community with a broad set of activities to improve knowledge and promote sustainable development.

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†† Staff

PhD	2
MsC	3
Graduated	2
Technical staff	2

Total members

Departments/areas of intervention

R&D / Nature and Biodiversity	 Protection and promotion of natural heritage and biodiversity; Evaluation and mitigation of the anthropogenic activities on ecosystems.
R&D / Water Resources	 Management of water resources; rivers rehabilitation
R&D / Landscape and Territory	 Landscape integration in territorial policies and implementation of European Landscape Convention; Territorial planning, management policies and promotion of community participation
R&D Urban Environment and Circular Economy	 Development of innovative solutions to face the urban environment's main challenges; Implementation of "Guimarães for Circular Economy" strategy.
Education for Sustainability	 Promotion of environmental education activities; Development of citizens' raise-awareness strategies; Coordination of Municipality Environmental Program (PEGADAS).

Total 6

Research projects

National Funding	Number	Total funding
Fundo Ambiental	1	75.500€
NO Planet B	1	7.500€
Total	2	83.000€
International Funding	Number	Total funding
European	-	-
Others	-	-
Total	-	-
Total	2	83.000€

(National + International)

Туре

Number

International meetings organization

1

Major achievements

Flagship projects



Ponds of Ave River

The project "Ponds of Ave river" was funded by the Environmental Fund of the Environment and Energy Transition Ministry. It was implemented at the Union of Parishes of Arosa and Castelões. It aimed to enhance the territory, wetland and riparian gallery, adding scientific and educational values to one of the most typical natural landscape of Guimarães.



VIMACT

The "VIMACT - Climate Action for the Reduction of the Ecological Footprint" aimed to improve biocapacity, through the renaturalization and recovery of the Penha Mountain. In addition, the project intended to engage citizens, promote public participation and raise awareness to reduce the municipal Ecological Footprint.



Ave for All

The project aims to build a platform to support the organization, management and improvement of the efficiency of logistics operations and picking in medium and large warehouses, based on paradigms such as IoT, 4.0 Industry and technologies such as augmented reality, indoor location and intelligent algorithms.

Governance of important institutions

EURO CITIES

Co-Chair of EuroCities Green Areas & Biodiversity Group

Landscape Laboratory is the co-chair of EuroCities Green Areas & Biodiversity Working Group. EuroCities is the leading network of more than 140 major cities, working together to improve the quality of urban life.

TECMINHO





TecMinho was founded in 1990 as an interface of the University of Minho. We are a private non-profit organisation located in Guimarães, Portugal (northern region), aiming to promote the region's development by stimulating new technologies and by promoting the transfer of knowledge between the University, enterprises and society. We are a certified training organisation accredited by DGERT (Portuguese Directorate-General for Employment and Work Relations). Our main purpose is to support services in the fields of innovation and new technologies and deliver continuous, advanced and specialised training and strategic information. TecMinho has a team of 24 collaborators working in 3 main fields:

(1) Training & Development: continuous, advanced and specialised/ professional education and training for individuals and companies; e-learning training services; research and innovation in education and training, organisational development projects, carreer and profissional development service

(2) Technology transfer & innovation with emphasis on intellectual property rights: promotion of national and European initiatives aimed at the transfer of experience and technological innovation between academia and industry; research and technological development; diffusion of scientific and technological information; patent research, industrial property and registration; and support in specialised services.

(3) Entrepreneurship: acceleration programmes, business start-ups and university spin-offs.

We have over 29 years experience in these fields and have collaborated in over 170 European and international projects, worked with approximately 900 European and international partner institutions (HEI, companies, business associations, ONGs, local authorities, etc.) from over 40 countries worldwide.

TecMinho is certified according to ISO 9001:2015, IQNET Management System.

TecMinho's Intervention Strategy:

• Promotion of innovation and development of new technologies / products / processes and their transfer to businesses;

 Promotion of Continuous Training activities (including e-learning), as well as organizational development and transnational mobility of human resources;

• Support to the creation of enterprises, with emphasis on academic spin-offs;

• Kick-start of projects of research / development, as well as guidance in its implementation. Director Hélder Filipe da Cunha Soutinho

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†† Staff

Technology Transfer	11
Entrepreneurship	3
Training	7
Administrative/Financial	5
Total members	26

Departments/areas of intervention

Technology Transfer /Commercialization of Science and Technology	Implementation of R&D and innovation projects involving researchers and companies to develop new products, process- es and services. Commercialization of Science and Technology Support researchers and companies in the commercial exploitation of results of R&D activities carrying out technological audits to companies to identify innovation needs and opportunities.
Technology Transfer/Protection of Industrial Property	Supporting researchers and companies in defining strategies to protect R&D results and obtaining this protection through different types of industrial property
Entrepreneurship	Support technology-based and intensive knowledge companies (start-ups and spin-offs) in the pre-launch and start- up phases.
Training/Continuous Training	Training for middle and upper management of companies, public administration and other entities in several areas of knowledge including design and implementation of training actions tailored to the needs of organizations; Individual- ized training to support problem solving and organizational and/or personal decision making and studies and research in education/training.
Training/Organizational & Profissional Development	Suport companies in processes of organizational change, combining technical and behavioural dimensions, in areas such as strategic, operational, human resources amn information systems management; support studentes, recent graduates and profissionals in the career management process
Training/e-Learning	Support trainers, professors and companies in the design and implementation of online courses and e-learning solutions. Development of applications, pedagogies and technologies in elearning, b-learning and m-learning. Development of innovative educational studies and projects using new and emerging technologies.
Total 6	

Research projects

National Funding	Number	Total funding
Portugal 2020 Programme	24	2.212.116 €
Others	13	573.066 €
Total	37	2.785.182€
International Funding	Number	Total funding
European	1	1.142.037 €
Others	7	232.417 €
Total	8	1.374.455€
	45	4.159.637€

(National + International)

Туре	Number
International meetings organization	5
National patents submitted	17
National patents granted	5
International patents granted	4
International patents submitted	9
Spin-offs with UMinho label	3
Start-ups with UMinho label	4

Major achievements

Flagship projects



NOBEL

European project H2020-NMBP-CSA-2017, CSA- Coordination and support action, in the topic NMBP-16-2017 - Mobilising the European nano-biomedical ecosystem. NOBEL will be unique in building the most efficient network of connections and synergies all along the value chain of Nanomedicine and healthcare technologies in Europe.



TAD

TAD: The Ability Advisor / Improving the Tourism for all Market by VET. Is one Erasmus+ project in the Key action cooperation for the innovation and the exchange of good practices in the Action and field: strategic partnership for Vocational Education and Training. The project has one main goal: to make Europe a more accessible tourist destination.



Minho Export

Portuguese project, NORTE-02-0752-FEDER-000015, SIAC-Internalization. Its mission is to train SME companies and support the mobilization of efforts in the definition of internationalization strategies and approaches to foreign markets, reinforcing the territorial competitiveness of Minho region.

INSTITUTIONAL PROJECTS

The University of Minho has been assuming, since its origin, a particular and central role as a regional development driver, performing a tremendous interaction with the society and the companies. In this respect we can state that this specific engagement has been contributing, essentially, to the following dimensions:

• Innovation transfer to companies, based on science and technology, helping them overcoming global challenges by introducing new knowledge, new competences, new technologies and, therefore, innovative solutions for both products and processes

• Qualification and requalification/reorientation of the human resources of the regional ecosystem

• Adaptation of technological infra-structures and productivity capacitation and new equipment and technologies for the industrialization of products and processes

• Definition of new intellectual property protection strategies through the international protection of intellectual assets

• Promotion of new public policies or adaptation of existent public policies in order to organize both public and private stakeholders to a sustainable and efficient path to the internationalization of our products and processes

In this context the Institutional partnerships assume a particularly important role so as to develop institutional projects that are inter and intra-disciplinary challenges for both the University and the external entities involved and have been proving its relevant contribution for the region and the country.

For 2019 four institutional projects could be referred and would be detailed in the following sections: Sensible Car, Easy Ride, Factory of Future and Minho Advanced Computing Centre.

UMINHO/BOSCH PARTNERSHIP

As stated in the previous edition of the Book "Research and Innovation", Bosch Car Multimedia Portugal, S.A. was aiming at reinforcing its position as a driver of knowledge and technology "made in Portugal" for the future of mobility. The future is autonomous driving, a technology revolution that is underway promising to radically change mobility and quality of life worldwide. The goal of autonomous driving requires enabling cars with an increasing capacity of understanding and responding to its state, the state of its occupants and its surrounding, automatically adjusting driving and information to different contexts. The 3rd Phase of cooperation UMinho/Bosch had already started with 3 new submitted research and innovation projects: Sensible Car; Easy Ride and Factory of Future, which have really started in 2019.

These 3 innovation projects with a total approved investment of around \in 90 M will possibly generate 33 new patents, more than 650 deliverables and 130 technical and scientific publications. These projects will also reinforce the R&D capacity of project partners, increasing youth employment through the hiring of more than 450 new associates for both Bosch and UMinho, fully dedicated to R&D activities. Moreover, more than 500 associates at Bosch and UMinho will be involved in this 3rd phase of UMinho/Bosch partnership. This is a start for Crossmapping the future of this partnership UMinho/Bosch Car Multimedia.

Crossmapping the Future | Sensible Car

The Sensible Car Program will try to develop technology for autonomous driving, based on critical intelligent sensors with functions of integral perception of the surroundings, of precise location and updated in real time, and of acting without fail.

Autonomous driving takes place, above all, through highly sensitive sensors capable of providing the vehicle with the capacity to per-



ceive and act on its state, that of its occupants and that of its surroundings.

In addition to Bosch and UMinho, the Sensible Car Program also has the participation of four external entities in support of technology development.

In this way, the International Iberian Nanotechnology Laboratory (INL), the Computer Graphics Center (CCG), the Pole of Innovation in Polymer Engineering (PIEP) and the Telecommunications Institute (IT), provide critical knowledge support to the four different Sensible Car Sub-programs.

The four Sub-Programs of the Sensible Car are oriented towards the development of the following autonomous driving sensors:

SP1 - LiDAR System

Development of critical subsystems of LiDAR technology, which will allow increasing automation of driving.

SP2 - Floor Condition Sensor

Development of a sensor for the early detection of the floor condition, which allows the adjustment of the vehicle speed.

SP3 - Sensor Automotive Precise Positioning

Development of a positioning sensor, in order to provide accurate measurements of the vehicle's position while driving.

SP4 - Sensors for Steering Systems

Development of steering angle measurement (SAS) sensors for power assisted electric steering systems, and Eddy current based sensors for application in steering system DC motors.

Crossmapping the Future | Easy Ride

The Easy Ride Program has as its main objectives the creation of technical and scientific knowledge and skills and the development of new technologies in Portugal, which translate into world innovations in the scope of the automobile of the future, enhancing the path to "zero vision"; contemplating, therefore, the development of highly innovative concepts and intelligent sensors critical to car training for the context of autonomous driving and the mobility of the future, through the structuring of five more specific Sub-Programs (SPs).



SP1 - Shared Autonomous Vehicle

SP1 is focused on the development of a set of multisensory systems, applied inside the vehicle, in the context of shared autonomous vehicles (SAV), with a view to the collection and management of data (image, audio, gas and other volatile compounds, vital signs, etc.).

SP2 - Vehicle to Everything Communication

SP2 stands out for the development of a set of vehicle communi-

cation solutions within the scope of autonomous cars (four wheels) and two-wheel vehicles that paves the way for communication between vehicles, people and infrastructure. Therefore, it aims to increase road safety and reduce road accidents through the development of a multi-technology V2X communications device applied to the contexts of Shared Autonomous Vehicle (SAV) and connected two-wheel vehicles (Connected 2 Wheelers - C2W).

SP3 - Connected 2-Wheeler

SP3 is specific to the development of solutions applied in the context of two-wheel vehicles (2-wheelers) as a way to include them in the future panorama of intelligent mobility, with a view to greater connectivity, safety and efficiency in two-wheel vehicles.

SP4 - Intelligent Cockpit

SP4 is dedicated to developing solutions for vehicle training to learn from experience (through data collected from SP1 sensors) in order to respond to all the needs of its occupants quickly and safely, in the context of the autonomous vehicle and the autonomous shared vehicle.

SP5 - Occupant's Emotional Monitoring System

The sub-project Occupant Emotional Monitoring System aims to develop new algorithms for the identification of the emotional state of the occupants of a vehicle, using visual information from different sensors.

Monitoring the vehicle's interior becomes increasingly important to ensure the well-being, comfort of passengers and, not least, their safety. The proposed work aims to use cameras placed inside the vehicle to efficiently analyze the occupants' body language. The increase in the capacity to analyze and understand the interior of the vehicle will allow the development of new vehicles and, consequently, the opening to the development of new mobility services.

Crossmapping the Future | Factory of Future

The Factory of Future Program consists of generating advanced knowledge and "made in Portugal" technology for the solutions of factories of the future, making it possible to respond to the automotive market that is characterized by rapid technological advancement, increasingly personalized demands from customers, in the context mass customization and competitive pressure that requires significant price reductions.

In this sense, the main objective of the Factory of Future Program aims to generate scientific and technological advances that will translate into a set of processes, systems and tools that will



provide a high level of flexibility and quality, combined with competitive costs, to the main operations related to the different phases of industrialization projects.

The project consists of 5 Sub-Programs that respond to the different areas of operation of Bosch: Quality Control (SP1), Logistics (SP2), Productive Process (SP3), Industrial Operations Management (SP4) and Management of Processes of Business - Business Intelligence (SP5).

SP1 - Quality Control

SP1 foresees the development of test methodologies, tools and systems that should give the company a greater capacity to respond to the increasingly demanding and complex requirements of the automotive industry.

SP2 - Logistics

SP2 intends to guarantee a greater perception of the operation, using all available resources to increase productivity and assertiveness of operational decisions, with a significant focus on waste reduction and an approach that follows the principles of lean methodology and the pull production paradigm.

SP3 - Productive Process

SP3 aims to combine the digital world and the physical world through computerized systems equipped with intelligent algorithms (e.g. machine learning) in order to make the production system more efficient.

SP4 - Industrial Operations Management

The general objective of SP4 is to develop a learning environment (training) with innovative characteristics, aimed at employees of the

Automatic Insertion lines and the adoption of maintenance practices that can significantly contribute to achieving superior performance in terms of quality, productivity and costs., as well as ensuring a safe productive environment for employees.

SP5 - Business Intelligence

SP5 provides for the development of an integrated environment for the analysis, visualization and reporting of business indicators, whether based on Bosch's KPITree, or through the use of analytical dashboards for the exploration and interactive analysis of data, allowing the processing of data in real time, through Artificial Intelligence algorithms / technology.



MINHO ADVANCED COMPUTING CENTRE

MACC (Minho Advanced Computing Centre) is a partnership between FCT (Foundation for Science and Technology) and University of Minho, established in 2017. MACC is installed at REN's data centre, in Riba de Ave, Minho (Portugal).

MACC is a national collaborative infrastructure that aims at:

• reinforcing traditional High Performance Computing research areas and enable the emergence of new research domains heavily dependent on Advance Computing Data Science;

• promoting and accelerating the structuring and coordination of the national scientific and technological critical mass in advanced computing, as a means to attract new scientific and economic activity;

• fostering the creation of economic activity in the domains of data intelligence and other advanced computing areas, through scientific driven spin-offs and by engaging research laboratories from reference international ICT companies.

Hardware

Currently, MACC is composed of the Bob supercomputer. **Bob** can perform a thousand billion calculation per second. Bob sports 600 compute-nodes and 9600 cores.

MACC has been granted one of EuroHPC JU's petascale supercomputers, Deucalion. Deucalion is expected to be operational by early 2022. This supercomputer will provide a unique and innovative context to demonstrate green computing principles in Europe and worldwide, by leveraging a fully sustainable infrastructure. Deucalion will be able to perform 10 million billion calculations per second.

Scientific Outputs

As a result, the MACC has 54 ongoing projects, which are part of the Advanced Computing Projects, granted by FCT in different scientific areas, such as Polymer Engineering, Physics, Computer Science, Chemistry, and others. These projects have an allocation of 25 million computational hours, with more than 100 researchers able to access these computational resources.

MACC is also collaborating with the BigHPC project, a strategic research project financed by COMPETE 2020 Program and FCT, in partnership with UT Austin, through the UT Austin Portugal Program.

Visualisation Centre

The first MACC visualisation centre is called VISLAB and is installed at University of Minho, in Braga. Other similar units will be installed in other regions of the country, in order to adequately serve the Portuguese scientific community.

The MACC infrastructure is integrated in the INCoDE.2030 (Portuguese Initiative for the Development of Digital Competences), in the specific context of the National Strategy for Advanced Computing, promoting the Portuguese participation in various European consortia for the development and use of advanced computing, namely the Iberian Network of Advanced Computing - RICA and the European High Performance Computing – EuroHPC JU.



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