

Research Unit

FACULTY OF SCIENCES
& TECHNOLOGY
UNIVERSITY OF COIMBRA



CES Centro de Estudos Sociais *Centre for Social Studies*

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FACULDADE DE
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Fotografia: Carlos Barradas



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The Centre for Social Studies of the University of Coimbra is a scientific institution focused on research and advanced training within the Social Sciences and the Humanities, through an inter and transdisciplinary approach. Since its foundation, in 1978, CES has been conducting research with and for an inclusive, innovative and reflexive society by promoting creative critical approaches in the face of some of the most urging challenges of contemporary societies. Its goal is to continue engaging generations of exceptionally talented researchers and students in the field of Social Sciences. CES scientific strategy aims to democratize knowledge, revitalize human rights and to contribute to the establishment of science as a public commodity. We pursue this mission by continuously reshaping our research fields in a response to the needs of the society. Our work covers a wide range of scientific activities and scope, at the national and international level, with particular focus on the North-South and South-North dialogues, contributing to the development, dissemination and application of cutting-edge science and to an advanced research and training of excellence. Over the years, besides carrying out hundreds of research projects, several of

them at a large international scale, CES was responsible for developing a large number of initiatives with a major impact both within the scientific community and in the society in general. Long-term monitoring of public policies, a consistent outreach and dissemination strategy and a large publication output contribute to the growing public resonance of CES' research. Currently, CES has 149 researchers, 85 postdoctoral researchers, around 450 doctoral researchers and 64 junior researchers. CES is organized in various research groups - decentralized units comprising a group of researchers who are interested in closely related areas or topics, namely: CCArq | Cities, Cultures, and Architecture Research Group
Research Areas: Cultural, Heritage and Symbolic Dimensions of Urban Planning and Public Buildings/Facilities; Architecture, Urban Regeneration and Identity; Cultural Policies, Inclusive Citizenship and City Governance; Public Spaces, Cultures and Participative Cities; Arts, Ways of Life and the Urban Experience
NECES | Science, Economy and Society Research Group
Research Areas: Crises, (Un)Sustainability and dynamics of capitalism; Political economy, economic policy and economic

polity; Risk, territories and governance; Science and technology studies
DECIDe | Democracy, Citizenship and Law Research Group
Research Areas: Human rights, violence(s) and citizenship; State, justice administration and public policy; Democratisation, political participation, and access to rights and justice through a comparative perspective; (Anti-)racism, citizenship, and political processes; Memory, identity constructions and recognition; Consumers' indebtedness and overindebtedness
NHUMEP | Humanities, Migration and Peace Studies Research Group
Research Areas: Discourses, identities, and representations; Immigration and Emigration: social dynamics and policies; History, memory, diasporas and post-colonialisms; Poetics, translation and comparative studies; Peace, interventionism and global governance; Violence, war, and post-conflict cultures
POSTRade | Social Policies, Labour and Inequalities Research Group
Research Areas: Social policies for citizenship; Social Risks and vulnerability: collective action, networks and organizations; Classes and social inequalities; Labour relations and trade unionism

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CNC-IBILI

*Center for Neuroscience and Cell Biology
and Institute for Biomedical Imaging and Life Sciences*

Coordinator

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CNC-IBILI is a new Institution created by joining two research institutes of excellence in the Life and Health Sciences based at the University of Coimbra – the Center for Neuroscience and Cell Biology (CNC), and the Institute for Biomedical Imaging and Life Sciences (IBILI). Overlap in scientific interests and a high level of complementarity guarantee that the whole will be greater than the sum of individual parts.

The CNC-IBILI unit incorporates the largest critical mass of biomedical investigators in the Center region of Portugal. CNC-IBILI is supported by a solid human resources and management structure, including 220 PhD integrated members and 50 dedicated management staff. Outstanding technological infrastructures are available, namely the Microscopy Imaging Center of Coimbra (MICC), the Institute for Nuclear Sciences Applied to Health (ICNAS), the NMR Platform, the Mass Spectrometry Unit, the Flow Cytometry Unit and a state of the art Animal Facility.

Deeply rooted at the University of Coimbra, CNC-IBILI joins together researchers from the Faculties of Medicine, Pharmacy, Science and Technology, the Institute for Interdisciplinary Research and University

Hospitals around common objectives of biomedical research. The synergies at CNC and IBILI create opportunities for novel achievements in neurosciences, vision, aging, brain and metabolism-based diseases and advanced therapies. CNC-IBILI is composed of 21 groups supported by strong Core CVs, that are organized in three Thematic Lines: 1) Neuroscience, Vision and Brain Diseases; 2) Metabolism, Aging and Disease; and 3) Stem Cell-Based and Molecular Therapies.

CNC-IBILI is uniquely positioned in terms of transforming excellent basic research in both translational interventions and increased economic value. The close connection to the Coimbra University Hospitals Health System (CHUC), one of the largest in Portugal, provides access to clinical knowhow, patient samples, and patients themselves, ensuring the possibility of both CNC-IBILI pioneered initiatives, and the participation in international consortia.

CNC-IBILI is totally committed to two other crucial aspects of any research institute that aims to excel, namely training and science communication. The high-level and multidisciplinary mentoring of PhD students, clinicians and postdoctoral

fellows in an international environment that fosters creative critical thinking in both basic and applied science is a top priority, developed both in in-house Masters and PhD Programs, and in international training networks. The need to be socially active and provide an efficient outreach program that creates an informed citizenship on scientific matters is another important aspect of the CNC-IBILI mission statement.

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CRIA

Centro em Rede de Investigação em Antropologia

Centre for Research in Anthropology

Coordinator

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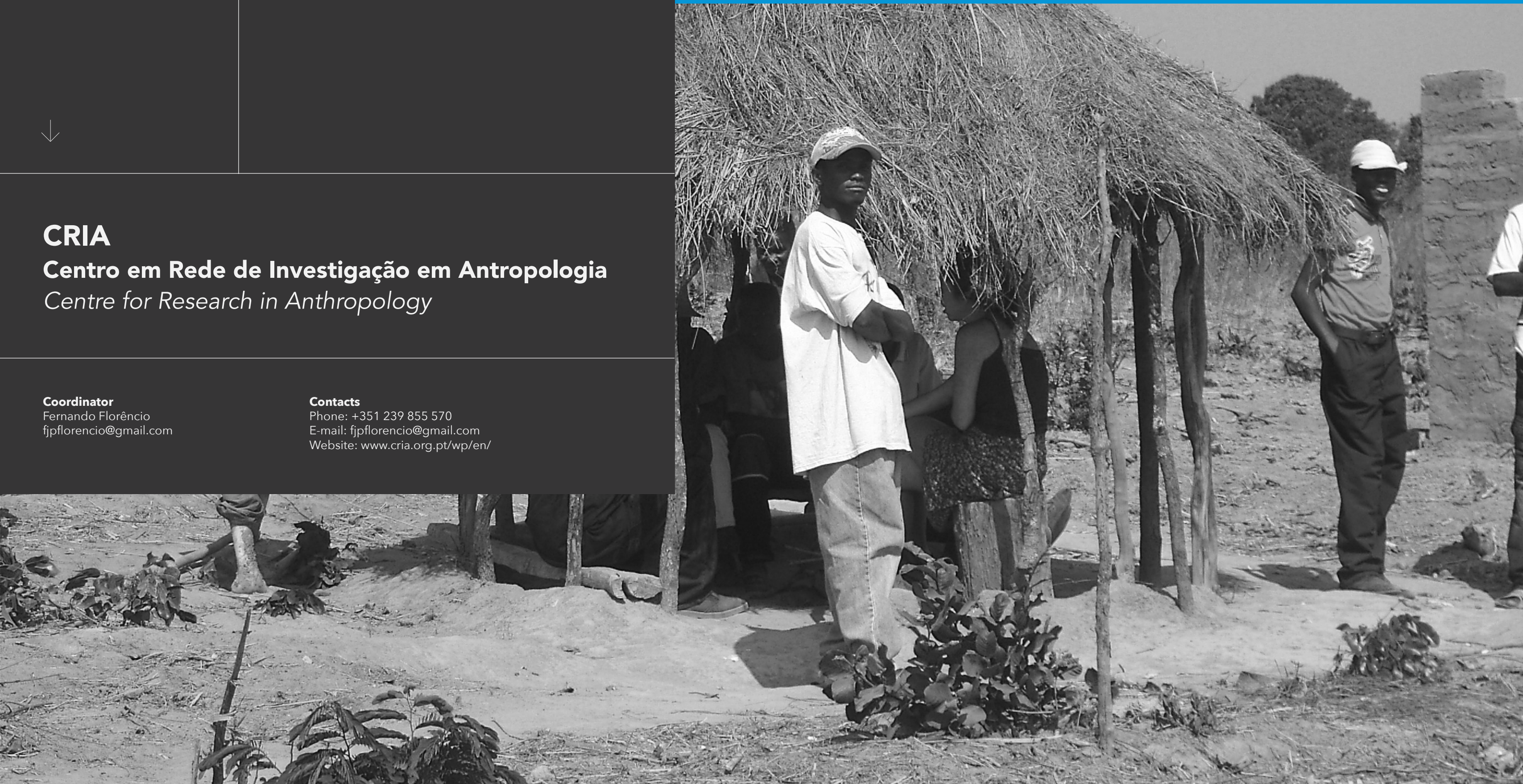
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CRIA is a dynamic network based on four universities (FCSH-Nova, ISCTE-IUL, U. Coimbra and UMinho). This network's functioning enables each institutional division to autonomously develop its own activities while they all share the fundamental resources necessary to the management, fundraising, research dissemination, teaching and knowledge transfer. It furthermore encourages the mobility of CRIA's researchers between the centre's different institutional grounds.

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:

- Circulation and Place-Making;
- Environment, Sustainability, and Ethnography;
- Governance, Policies and Livelihoods;
- Practices and Politics of Culture.

Complementary, thematic lines and working groups aggregate researchers from the different research groups around particular subjects and contexts of research, such as:

- Anthropology of Health;
- Visual Anthropology and Arts Laboratory;
- Studies in Arab and Islamic Contexts;
- Anthropology of Religion;
- Informal Resources, State and Social Capital.

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IT - COIMBRA

Instituto de Telecomunicações
Telecommunications Institute

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IT Coimbra is a private, not-for-profit organization, of public interest, a partnership of nine institutions involved in research and development in the field of Telecommunications.

IT mission is to create and disseminate scientific knowledge in the field of telecommunications. IT is actively involved in fundamental and applied research both at national and international levels. Simultaneously, IT is committed to foster higher education and training, by hosting and tutoring graduate and postgraduate students.

IT also plays its role towards public society with public awareness initiatives, knowledge transfer to industry, and by providing consulting services on a non-competing basis.

Scientific expertise in IT, from which follow its main research and education activities, spans the following areas:

- Wireless Communications;
- Optical Communications;
- Networks and Multimedia;
- Basic Sciences and Enabling Technologies.

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INESC COIMBRA

**Instituto de Engenharia de Sistemas
e Computadores de Coimbra**

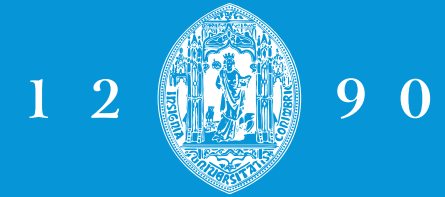
*Institute for Systems and Computers
Engineering – Coimbra*

Coordinator

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The Institute for Systems Engineering and Computers at Coimbra (INESC Coimbra) is a non-profit R&D institute, affiliated with the University of Coimbra (UC), the Institute for Systems Engineering and Computers (INESC) and the Polytechnic Institute of Leiria (IPL).

INESC Coimbra continues the activities of the former Coimbra branch of INESC, which dates back to 1986 through an agreement between the University of Coimbra and INESC and a specific protocol for the Operational Research area. Since that date onwards, research and development activities have evolved from that initial core related to operational research through the collaboration of new researchers and progressively covering new research areas. INESC Coimbra started its activities as an autonomous institution in January 2002. A branch of INESC Coimbra is located in the Polytechnic Institute of Leiria since 2009.

INESC Coimbra's statutory mission is to perform scientific research, technological development, and knowledge integration and transfer, based on several disciplines of Engineering and Management Science / Operations Research, aiming at contributing to a better performance of businesses and institutions and to the progress of knowledge, within an engineering systems approach, by creatively combining theory and methodology, technical issues and human factors to tackle complex problems.

The different backgrounds (mainly in Electrical and Computer Engineering, Civil Engineering, Geographical Engineering, Mechanical Engineering, Management and Mathematics) and scientific interests allow INESC Coimbra's researchers to collaborate, to challenge each other and to learn from each other in addressing complex problems. On the one hand, sciences of engineering are used to address management and performance analysis problems (e.g. planning,

controlling, project analysis and system evaluation). On the other hand, management science's decision aiding techniques are used to address engineering problems (energy planning and rational use of energy, telecommunication networks analysis and planning, teletraffic engineering, urban and regional planning, computational mechanics). The joint projects, papers, and thesis supervisions demonstrate this synergy.

INESC Coimbra currently integrates more than 100 researchers, from three departments of the Faculty of Sciences and Technology of UC (Electrical Engineering and Computers, Civil Engineering, and Mathematics) and the Faculty Economics, as well as from the University of Beira Interior, Open University and the Polytechnic Institutes of Leiria, Coimbra, Setúbal, Bragança, Viana do Castelo and Viseu.

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ISR

Instituto de Sistemas e Robótica

Institute of Systems and Robotics

Coordinator

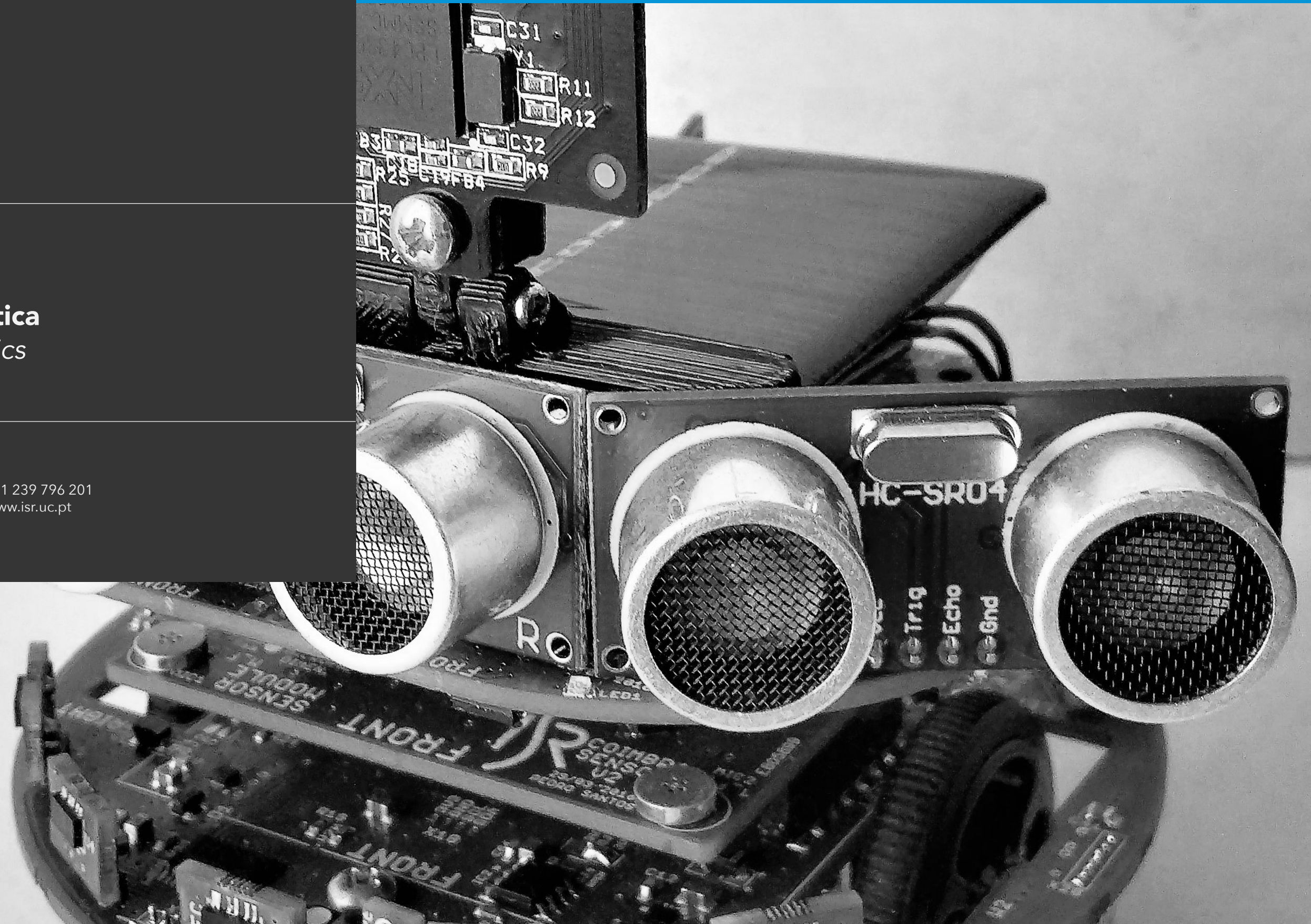
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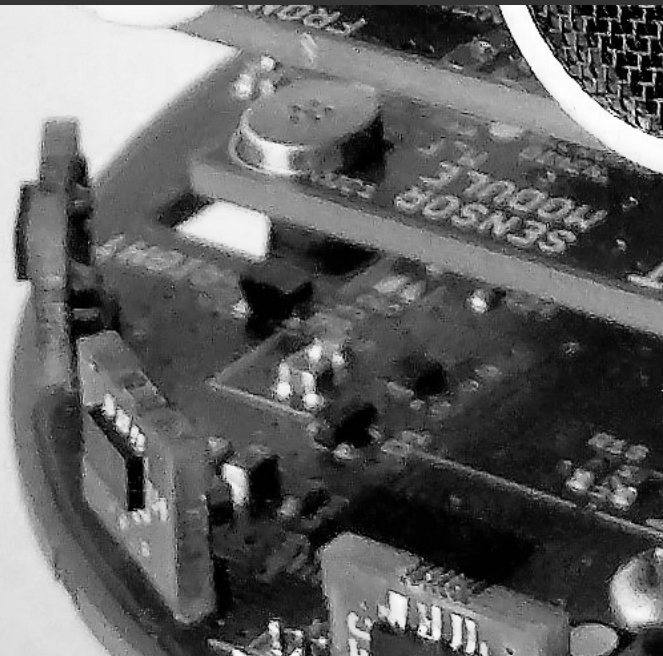




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The Institute of Systems and Robotics—University of Coimbra (ISR-UC) promotes advanced multidisciplinary R&D in the areas Medical Robotics, Assistive Technologies, Soft MEMS, Biomedical Engineering, Autonomous Robotics, Intelligent Transportation Systems, Computer Vision, Advanced Industrial Automation Technologies and Intelligent Energy Systems. ISR has strong links with industry, and promotes the creation of successful spin-offs (two H2020 SME Awards in 2016, plus another in 2017). In the last evaluations ISR-UC received a rating of Excellent by the FCT International Panel.

ISR-UC is organized in two research groups:

- Automation and Robotics for Human Life;
- Computer Vision and Robot Perception.

In the AUTOMATION AND ROBOTICS FOR HUMAN LIFE Group, research is carried out in several areas and with the following objectives:

- Medical Robotics: research on haptics to provide realism in surgical robotics, and on enhanced telepresence and human-robot skill transfers.
- Autonomous Vehicles and ITS: research on autonomous vehicles with the development of navigation systems and perception technologies, such as pedestrian detection, sensor fusion for accurate localization, and

path-following control.

- Human-Centered Mobile Robotics and Computational Intelligence: research on robotics for mobility assistance (e.g. brain-computer interfaces (BCI), and human-machine collaborative control); and on new soft sensors and intelligent control techniques applied in industrial plants, and on new learning and classifiers techniques
- Multi-modal Perception for autonomous systems and Human-robot Interaction
- Service Robots, including hazardous environments
- Intelligent Energy Systems: Research on energy-efficient and clean alternate energy technologies for robotics, automation and electric vehicles, Advanced motor drive systems, Smart grids and electricity end-use efficiency.

The COMPUTER VISION AND ROBOT PERCEPTION GROUP addresses the following topics:

- Geometric computer vision including camera calibration, pose estimation, 3D reconstruction, radial distortion modeling;
- Camera models;
- Application of differentiable manifolds to computer vision problems such as image segmentation, tracking, object recognition and learning;
- Segmentation and tracking;

- Classification and Clustering;
- Application of a Bayesian framework to multimodality sensing, adaptive decision, and action/ actuation in robotic systems;
- 3D shape analysis under a Riemannian framework;
- Spatiotemporal analysis of human facial/ bodily signals;
- Video surveillance in general (indoors or outdoors) using camera networks with or without overlapping fields of view.
- The interpretation of human actions and human-computer interaction.
- Video surveillance of outdoors environment was also a goal, in particular its application to analysis of freeway traffic.

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LAETA

Laboratório Associado de Energia, Transportes e Aeronáutica

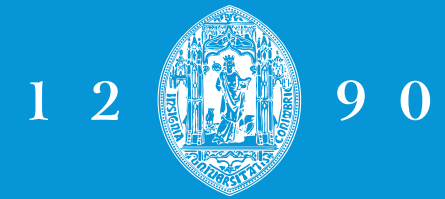
*Associated Laboratory for Energy, Transports and
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The mission of LAETA is to set-up a research and development network with engineering know-how in all fields contributing to transports and energy and aerospace that will promote partnerships with SME's, European consortiums, national and international entities involved in regulation and standardization and public and private institutions involved in R&D in order to transfer new technologies, to implement new engineering procedures of project, design, manufacturing and testing of products and to promote the dissemination of knowledge and the education and training of technicians and engineers to overcome existing lacks in education and to acquire new competences. LAETA is a member of the Council of the Associated Laboratories (CLA). IDMEC/UL is the leader research institute of LAETA.

The Laboratory is composed by the following research units:

- Institute of Mechanical Engineering (IDMEC/UL);
- Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI/UP);
- Association for the Development of Industrial Aerodynamics (ADAI/UC);
- Aeronautics and Astronautics Research Center (AEROG/UBI).

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LIP

Laboratório de Instrumentação e Física Experimental de Partículas

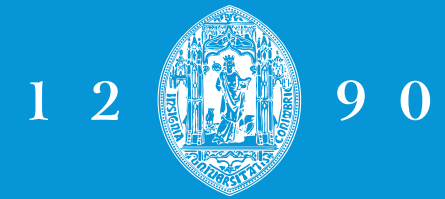
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Particles Physics*

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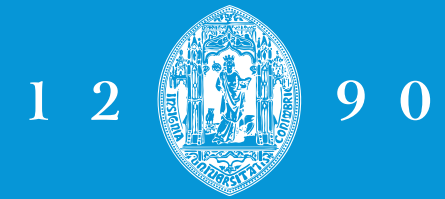
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LIP is a scientific and technical association of public utility that has for goal the research in the fields of Experimental High Energy Physics and Associated Instrumentation. LIP's research domains have grown to encompass Experimental High Energy Physics and Astroparticles, radiation detection instrumentation, data acquisition and data processing, advanced computing and applications to other fields, in particular Medical Physics. The main research activities of the lab are developed in the framework of large collaborations at CERN and at other international organizations and large facilities in Europe and elsewhere, such as ESA, SNOLAB, GSI, NASA and AUGER. LIP is an "associated laboratory" assessed as "Excellent" in three successive evaluations by international panels. In its three laboratories in Coimbra, Lisbon and Minho, LIP has about 190 people, out of which ca. 90 hold a PhD degree, and many are professors at the local universities.

LIP-Coimbra has a long experience in the Research and Development of radiation detection systems and their applications in experiments. Its activity is supported by a well equipped machine shop and staff.

Research Lines:

- Experimental particle and astroparticle physics;
- Structure of matter physics;
- Cosmic ray physics;
- Dark matter and neutrino physics;
- Development of new instruments and methods;
- Instruments and methods for biomedical applications;
- Radiation environment studies and applications for space missions.