DEI

DEPARTAMENTO DE ENGENHARIA INFORMÁTICA

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About DEI

The activities in the area of Informatics Engineering started at FEUP in the beginning of 90's. The Department of Informatics Engineering (DEI) started formally its activities on January 1st, 2008. DEI includes a faculty staff of 55 members (35 hold a PhD) involved in the following scientific areas:

• Computing Systems Architecture and Networks
• Computer Graphics, Human-Computer Interaction and Multimedia
• Information Systems
• Intelligent Systems
• Programming Fundamentals and Techniques
• Software Engineering

MISSION

• Provide international training in Engineering Informatics, scientific, technical, ethical and cultural aspects;
• To carry out research and development of excellence for the advancement of Computer Science, and to sustain the training activities in Computer Engineering.

PROGRAMS

UNDERGRADUATE

LCI
Bachelor of Arts in Information Science
Joint program with FLUP (admin.)

INTEGRATED MASTERS

MEIC
Master in Informatics and Computing Engineering
https://dei.fe.up.pt/mieic/en/homepage/

MASTERS

MCI
Master in Information Science

MM
Master in Multimedia
https://dei.fe.up.pt/mm/en/

MESW
Master in Software Engineering
https://dei.fe.up.pt/mesw/en/home/

DOCTORAL PROGRAMS

PRODEI
Doctoral Program in Informatics Engineering
https://dei.fe.up.pt/prodei/en/home/

PDMD
Doctoral Program in Digital Media
https://dei.fe.up.pt/pdmd/en/home-page-2/

MAP-i
Doctoral Program in Computer Science
Joint program with FCUP (admin.), UA, UM
https://map.map.edu.pt/

DEI R&D Labs:

Most members of DEI do their research mainly at the following R&D Labs located at DEI:

• Artificial Intelligence R&D Lab – Robotics and Simulation
• Artificial Intelligence R&D Lab – Multi-Agent Systems
• Information Systems R&D Lab
• Computing Systems R&D Lab
• Graphics, Interaction and Games R&D Lab
• Software Engineering R&D Lab
• Digital Media R&D Lab
• Sound and Music Computing R&D Lab
• Pervasive Computing R&D Lab recent
• Labs@DEI recent

A number of DEI members also participate in R&D projects at the following Research Units, funded by FCT (Portuguese Science Foundation):

INESC TEC
Institute for Systems and Computer Engineering of Porto (FCT Associate Laboratory)

LIACC
Artificial Intelligence and Computer Science Laboratory

INEB
Institute of Biomedical Engineering (an unit part of the FCT Associate Laboratory: IBMC.INEB)

LIAAD, affiliated with INESC TEC
Laboratory of Artificial Intelligence and Decision Support (affiliated to INESC-TEC)

ISR
Institute for Systems and Robotics

Sound and Music Computing Lab

Mission
The Sound and Music Computing Lab hosts research in applied computing, arts and humanities, and various topics within sound and music computing. It combines basic research in signal processing, pattern recognition, music and human-computer interaction, and aims at contributing to make computers better understand, model and generate sounds and music, both with and without interaction with human performers. The SMC Lab supports research not only in audio synthesis and computational processing of sound, but also in automatic and procedural music generation e.g., for usage in interactive computational systems, 3D audio spacialization for integration in virtual environments, among other application contexts. It is highly prepared with sound and audio specific equipment, and acoustically prepared for the associated activities and for audio content production and post-production.

Topics of Interest
· Sound Design for Digital Media
· Immersive Sonic Environments
· Generative Music
· Interactive Music
· Interfaces for Musical Expression
· Augmented Musical Instruments
· Software for Musical Composition and Sonic Production
· Music Information Retrieval
· Computational Musicology
· Mapping and Data Sonification

Computing Systems Lab

Mission
The COMPSYS Lab hosts research in computer systems (including computer architectures, embedded and cyber-physical systems, real-time systems, dependable and fault-tolerant systems and networks), in software organization and properties (software system structures, distributed systems organizing principles, embedded software, and real-time software), in ubiquitous and mobile computing systems (design and evaluation methods), and in software notations and tools (mostly on compilers and domain specific languages). The mission of the COMPSYS Lab is to perform applied and fundamental cutting-edge research, of international level, with the goal to achieve significant research advances, to contribute to the education and training of human resources, to stablish cooperation with industry, and to contribute to solutions for problems with societal impact.

Topics of Interest
· Domain-Specific Languages (DSLs)
· Compilers and Tools
· Custom and Reconfigurable Computing (including FPGAs)
· Embedded Computing
· High-Performance Computing (with emphasis on embedded systems)
· Real-Time Systems
· Distributed Computing
· Mobile Computing
· Context-aware Computing

Software Engineering Lab

Mission
Software is increasingly present in our daily life spanning diverse areas such as navigation systems, control systems, Software as a service, Software to support learning at distance, etc. In this context, Software quality should be seriously considered. Software Engineering is concerned with Software quality issues, that is, Software constructed in a systematic, rigorous, measurable, timely manner, within budget and according to specifications.
Our mission is:
to develop novel methods, techniques, and tools that advance the way in which Software is designed, synthetized and assessed;
to ensure that our research results have a lasting impact in Software development practice;
to offer students an education that prepares them to take a leading role in complex Software development projects; and
to contribute to improve the competitiveness of the industry.

Topics of Interest
· Model-Driven Software Engineering
· Software Patterns and Paradigms
· Model-Based Software Testing
· Mobile Testing
· Software Process Improvement
· Knowledge Management in Software Engineering
· Software Requirements Evolution
· Serious Games for Software Engineering Education
· Agile Methods

Artificial Intelligence Lab

Mission
The Artificial Intelligence Lab intends to contribute for the research on specific aspects of Intelligent Systems, benefiting from approaches built on Distributed and Decentralized Coordination and Cooperation, and to apply those approaches to different real domains. This lab carries out research on AI-based methods for knowledge extraction and inference, in particular text mining. It also investigates techniques to deal with hardware and system software failures, as well as intentional changes within the complex system environment, such as resilient and reactive schedulers that can withstand errors at the node and/or the cluster-level.

Topics of Interest
· Intelligent Systems Interoperability for services networking and cooperation
· Planning, Scheduling and Disruption Management
· Agents: Adaptation, Learning and Emotions
· Argumentation-based Agents
· Text Mining and Social Network Analysis
· Cloud, Parallel computing
· Multi-Agent Systems Infrastructures and Applications
· Theories and methodologies of modelling and simulation
· Social Simulation and analysis of complex systems
· Socio-technical systems engineering and analysis
· Intelligent Transportation Systems
· Smart Cities
· Interactive and Social Robotics
· Computer Vision
· Spatio-temporal data analysis
· Behaviour modelling techniques
· Artificial Intelligence and Games

Computer Graphics, Interaction and Games Lab

Mission
The Graphics, Interaction and Games (GIG) Lab gathers a group of seven senior and post-doc researchers and more than 20 PhD, MSc and other junior researchers in the areas of computer graphics, human-computer interaction (HCI) and game design and development. Their research in computer graphics includes 3D modelling and realistic rendering, real-time rendering and animation (2D and 3D), procedural modelling of 2D and 3D environments (often associated with GIS applications), multisensorial virtual and augmented reality, and GPU programming. In the field of HCI, there is a particular focus on user interaction and user experience, including interface and interaction design, multimodal interfaces, natural user interfaces, physical computing and usability. Many of these come together in game design and development, where the lab hosts a particular focus on serious games, location-based games and gamification.

Topics of Interest
· Computer Graphics
· Human-Computer Interaction; Digital Interactive Systems
· Multisensory Virtual Reality and Augmented Reality
· Geospatial Systems
· Computer Vision
· Digital Game Design and Development; Serious Games
· Multimedia
· GPU Programming

Information Systems Lab

Mission
The mission of InfoLab is to design, implement and test information systems for a broad area of applications, addressing relevant problems in research, industry and society in general. Research areas and projects at InfoLab concern information management and information retrieval, as illustrated in tools for web search, data analysis, research data management and digital preservation. Work in digital preservation includes models, methods and tools particularly in the area of database preservation, research data repository management and e-science. To do so, InfoLab combines different backgrounds on Informatics Engineering and Information Science.

Topics of Interest
· Information management
· Information retrieval
· Information processing
· Digital preservation
· Research data management
· Text mining
· Web mining
· Recommender systems
· Social web
· Semantic web

Further Information:
https://dei.fe.up.pt/en/research/