TÉCNICO LISBOA

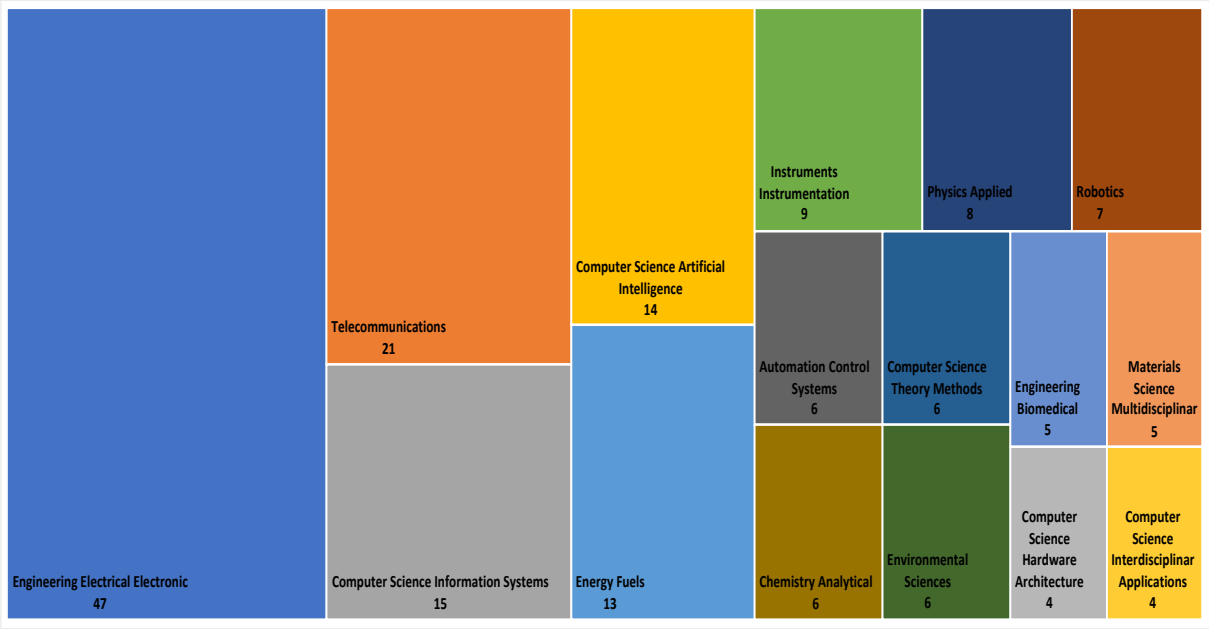
Electrical and Computer Engineering Department

Research Portfolio 2024

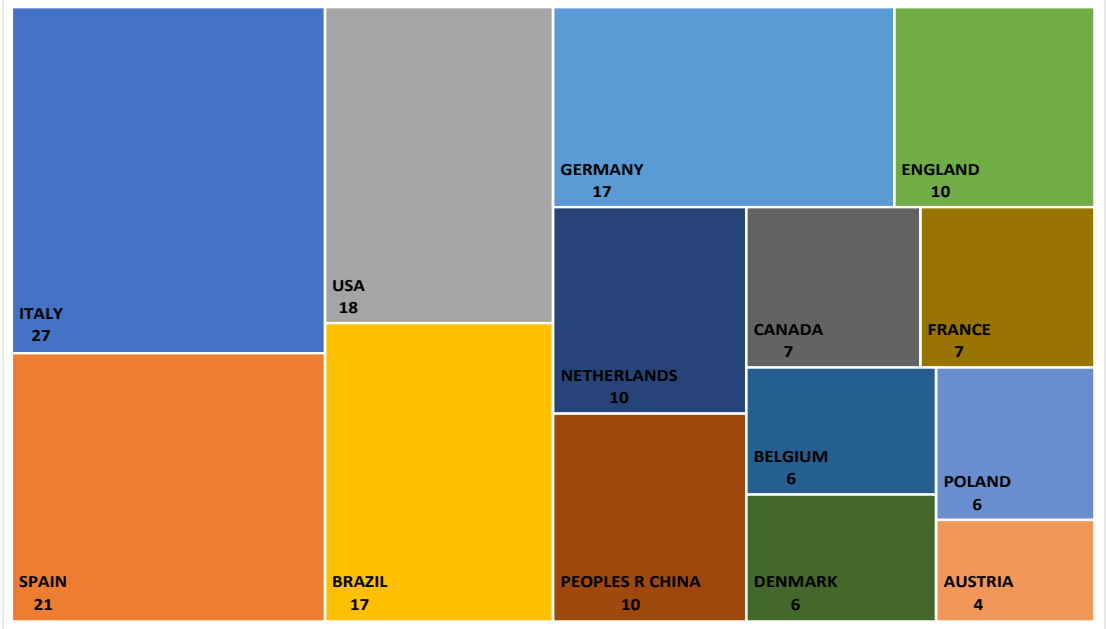
Overview

This publication provides an overview of the research topics pursued by our faculty members, encompassing various theoretical and experimental aspects of electrical and computer engineering. The department comprises approximately 100 faculty members with doctoral degrees, organized into five scientific areas: Computers (COMP), Electronics (ELEC), Energy (ENER), Systems, Decision, and Control (SDC), and Telecommunications (TELE).

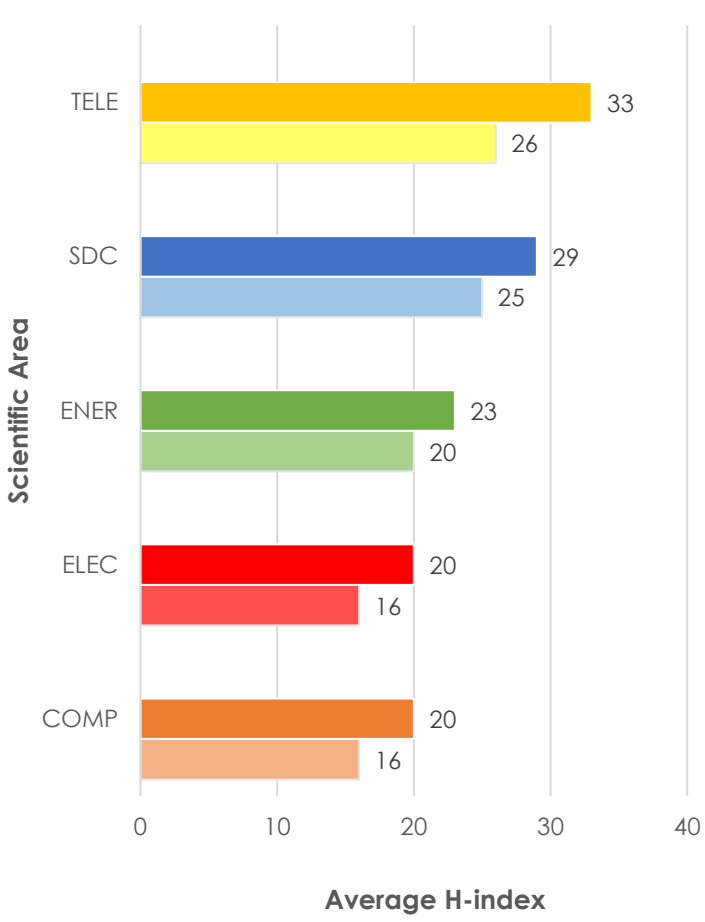
The research output, compiled in October 2024, included 292 journal publications indexed in the Web of Science for the period 2022–2024 (with data for 2024 not yet fully complete). These publications garnered a total of 697 citations, contributing to an h-index of 11. These works spans a wide range of topics within electrical and computer engineering. From these publications 38 % had co-authors affiliated to international institutions, which reveals the global orientation of the department, and its affiliated research institutes.

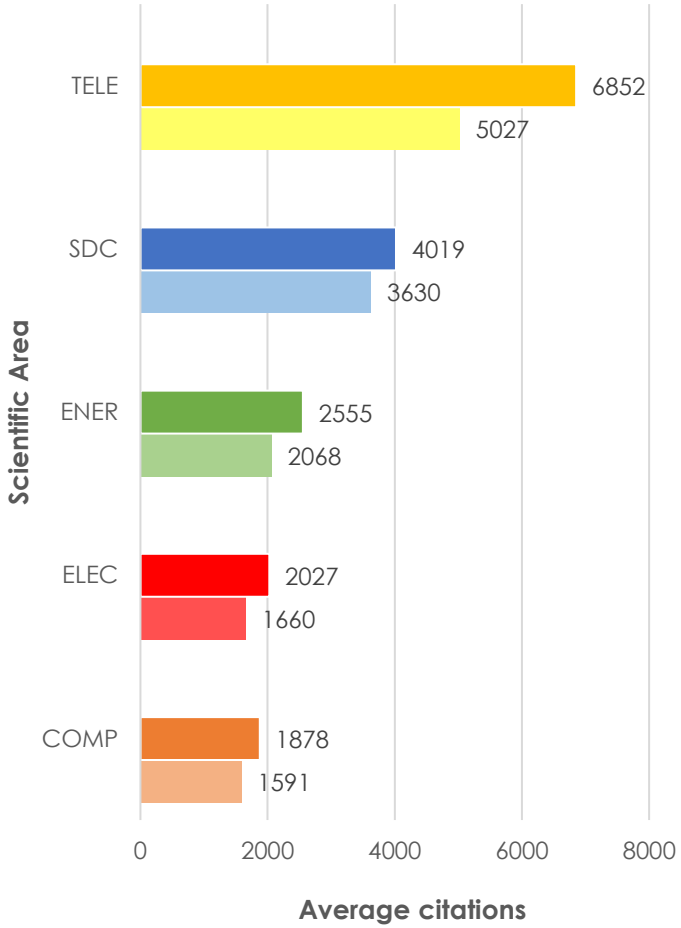


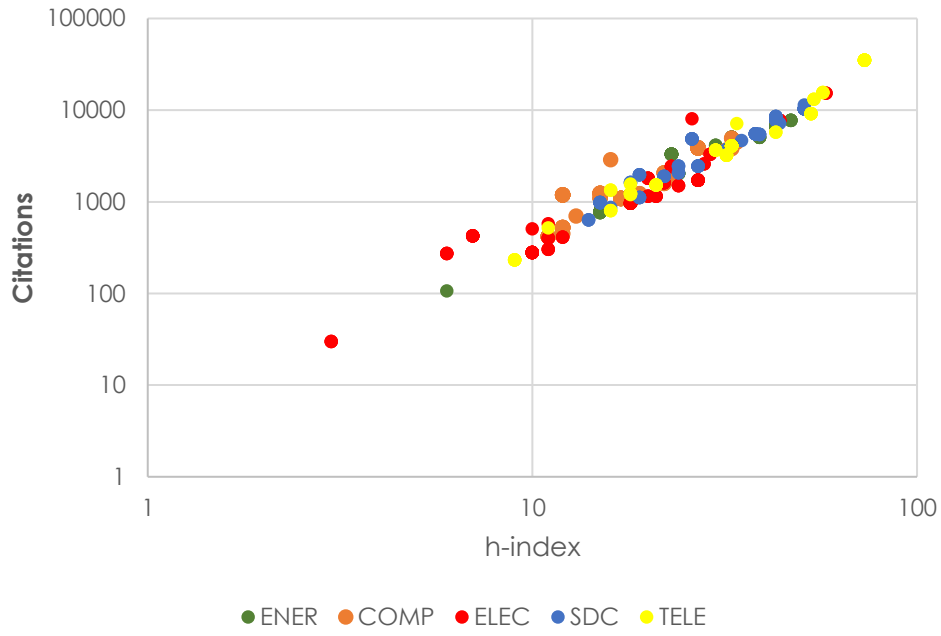
Main areas of publications by DEEC faculty members.



DEEC publications global footprint.







Number of citations as function of the h -index for each faculty member. Data from Google Scholar.

Left) Average h-index for the faculty members in each scientific area; right) Average number of citations for the faculty members in each scientific area. The top bar of the bar chart corresponds to data related to 2024 from the respective scientific areas and the bottom bars correspond to data from 2022. Data from Google Scholar.

Research Institutes

A significant part of the faculty members, named here, are appointed with the following department associate research institutes.

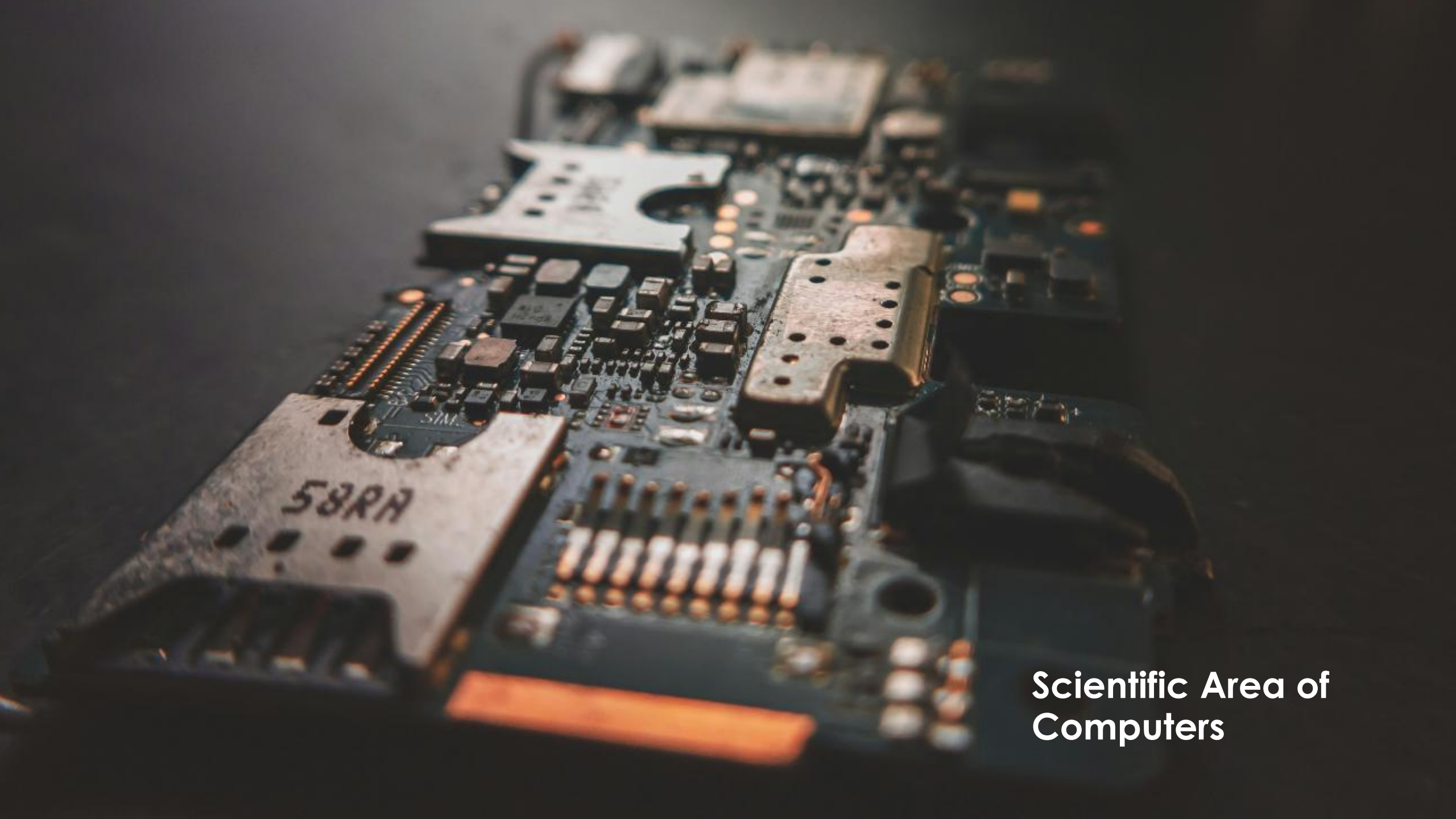
INESC-ID - Instituto de Engenharia de Sistemas de Computadores Investigação e Desenvolvimento
https://inesc-inov-lab.pt/index.html

IDMEC - Instituto de Engenharia Mecânica
https://www.idmec.tecnico.ulisboa.pt

ISR - Instituto de Sistemas e Robótica
https://welcome.isr.tecnico.ulisboa.pt

INESC INOV-Lab (INOV-Lab)
https://inesc-inov-lab.pt/index.html

IT - Instituto de Telecomunicações
https://www.it.pt



Scientific Area of Computers

Aleksandar Ilic

Phone: (+351) 213100300

E-mail: aleksandar.ilic@tecnico.ulisboa.pt

Scholar ID: HJks-BUAAAAJ

ORCID: 0000-0002-8594-3539

Author ID: 56426644400

Current position: Associate Professor

Computers

Research unit: INESC-ID

Research interests:

My main research interests include: Performance modeling, High-performance and Energy-efficient Computing, Parallel and Emerging Computer Architectures (CPU, GPU, TPU, IPU etc.), Heterogenous Systems and Applications (bioinfomatics, load balancing, code optimization, parallelization, etc).

Selected publications:

- A. Ilic, F. Pratas and L. Sousa. "Cache-aware Roofline model: Upgrading the loft", IEEE Computer Architecture Letters, vol. 13, n. 1, pp. 21-24, 2014.
- JD Trotter, S. Ekmekçibaşı, J. Langguth, T. Torun, E. Düzakın, A. Ilic, D. Unat, "Bringing Order to Sparsity: A Sparse Matrix Reordering Study on Multicore CPUs", International Conference for High Performance Computing, Networking, Storage and Analysis (SC'23), vol. 31, pp. 1-13, 2023.
- M. Graça, R. Nobre, L. Sousa, A. Ilic, "Distributed transformer for high order epistasis detection in large-scale datasets", Nature Scientific Reports, vol. 14, n. 1, pp. 14579, 2024.

Alexandra Martins de Carvalho

Phone: (+351) 218418389

E-mail: alexandra.carvalho@tecnico.ulisboa.pt

Scholar ID: A-DQoSoAAAAJ

ORCID: 0000-0001-6607-7711

Author ID: 7201882532

Current position: Assistant Professor

Computers

Research unit: IT

Research interests:

My main research interests are machine learning, including, probabilistic graphical models such as Bayesian networks, and algorithms, namely, combinatorics and complexity analysis. Focusing temporal data mining, in particular, Markovian data, dynamic Bayesian networks and other model-based models are also of interest. Applications in human health care include automatic diagnoses and prognosis, as well as personalized therapies for individual patients. The emerging availability of electronic medical records, is triggering this line of research, being one of the main problems modelling the dynamic process underlying the data evolution.

Selected publications:

- Alexandra M. Carvalho, Teemu Roos, Arlindo L. Oliveira and Petri Myllymäki, Discriminative learning of Bayesian networks via factorized conditional loglikelihood, Journal of Machine Learning Research 12(Jul):2181-2210, 2011.
- Alexandra M. Carvalho, Pedro Adão and Paulo Mateus, Hybrid learning of Bayesian multinets for binary classification, Pattern Recognition 47(10):3438-3450, 2014.
- Rui P. Guerra, Alexandra M. Carvalho and Paulo Mateus, Model selection for clustering of pharmacokinetic responses, Computer Methods and Programs in Biomedicine 162:11-18, 2018.

António Grilo

Phone: (+351) 213100226

E-mail: antonio.grilo@inesc-id.pt

Scholar ID: 2q5jguUAAAAJ

ORCID: 0000-0002-3806-0055

Author ID: 36466244900

Current position: Associate Professor

Research unit: INESC-ID

Computers

Research interests:

Mobile and Wireless Networks, Internet of Things (IoT), Ad hoc & Sensor Networks, Mesh Networks, Smart Utility communications.

Selected publications:

- S. E. Sabino and A. M. Grilo, "NSGA-II Based Joint Topology and Routing Optimization of Flying Backhaul Networks," in IEEE Access, vol. 10, pp. 96180-96196, 2022.
- A. Carvalho, L. M. Correia, A. Grilo and R. Dinis, "Analysis of Strategies for Minimising End-to-End Latency in 5G Networks," 2022 International Conference on Broadband Communications for Next Generation Networks and Multimedia Applications (CoBCom), 2022.
- S. Stiri, A. Chaoub, A. Grilo, R. Bennani, B. Lakssir and A. Tamtaoui, "Hybrid PLC and LoRaWAN Smart Metering Networks: Modeling and Optimization," in IEEE Transactions on Industrial Informatics, vol. 18, no. 3, pp. 1572-1582, 2022.

Bertinho D'Andrade da Costa

Phone: (+351) 21 8417241

E-mail: b.andrade.costa@tecnico.ulisboa.pt

Scholar ID: Rl76WNcAAAAJ

ORCID: 0000-0001-9798-8577

Author ID: 13607112100

Current position: Assistant Professor

Computers

Research unit: INESC-ID

Research interests:

The research interests are concerned with the application of modelling and control theory to solar energy systems (Control of Solar Furnaces), biomedical systems (Control of Anesthesia and cancer), biosystems (Control of greenhouse) and computer systems for digital control/cyber-physical systems.

Selected publications:

- Bertinho A. Costa,., João M. Lemos, A reinforcement learning approach for adaptive tracking control of a reusable rocket model in a landing scenario; Neurocomputing Volume 577, 2024.
- Bertinho A. Costa, Teresa Mendonça, GALENO: Computer aided system for modeling, monitoring, and control in anesthesia; Advanced Control for Applications: Volume 3, Issue 4, 2021.
- Bertinho A. Costa, João M. Lemos, Emmanuel Guillot, Solar furnace temperature control with active cooling; Solar Energy Volume 159, 2018.
- Bertinho A. Costa and João M. Lemos, Optimal Control of the temperature in a solar furnance; Optimal Control Applications and Methods, 2016.
- Bertinho Manuel D' Andrade da Costa, João Manuel Lage de Miranda Lemos. An adaptive temperature control law for a solar furnace; Control Engineering Pratice - Elsevier, 17 (10), 1157-1173, 2009.

Bruno Martins

Phone: (+351) 934810158

E-mail: bruno.g.martins@tecnico.ulisboa.pt

Scholar ID: VQMUt8kAAAAJ

ORCID: 0000-0002-3856-2936

Author ID: 8546762500

Current position: Associate Professor

Research unit: INESC-ID

Research interests:

Computers

I work on problems related to the general areas of information retrieval, natural language processing, multimodal machine learning, and the geographical information sciences. I have been involved in several research projects related to geospatial aspects in multimodal information access and retrieval, and I have accumulated significant expertise in addressing challenges at the intersection of information retrieval and the geographical information sciences, often through the use of machine learning methods.

Selected publications:

- João Daniel Silva, João Magalhães, Devis Tuia, and Bruno Martins, Multilingual Vision-Language Pre-training for the Remote Sensing Domain, Proceedings of the ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2024.
- Marina Georgati, João Monteiro, Bruno Martins, Henning Sten Hansen, and Carsten Keßler, Modelling Population Distribution: A Visual and Quantitative Analysis of Gradient Boosting and Deep Learning Models for Multi-Output Spatial Disaggregation, Transactions in GIS, vol. 28, no. 2, 2024.
- Rita Ramos, Bruno Martins, Desmond Elliott, and Yova Kementchedjhieva, SmallCap: Lightweight Image Captioning Prompted with Retrieval Augmentation, Proceedings of the IEEE/CVF Computer Vision and Pattern Recognition Conference, 2023.

Carlos Ribeiro Almeida

Phone: (+351) 218418397

E-mail: carlos.r.almeida@tecnico.ulisboa.pt

Scholar ID: mLoG_AcAAAAJ

ORCID: 0000-0003-1002-9635

Author ID: 57190208793

Current position: Assistant Professor

Computers

Research unit: IT

Research interests:

Main research interests are: real-time and embedded systems, QoS adaptability, faulttolerance and sensor networks.

Selected publications:

- C. Almeida, "System Support and Dependable Adaptation in Small Real-Time Embedded Systems", IEEE LATIN AMERICA TRANSACTIONS, VOL. 14, NO. 10, pp. 4402-4408, October 2016.
- C. Almeida, "Timely and Dependable QoS Adaptation in Quasi-Synchronous Systems", International Journal of Computers and Applications, ACTA Press, Volume 33, Number 3, pp. 179-188. 2011.
- C. Almeida and P. Veríssimo, "Using light-weight groups to handle timing failures in quasi-synchronous systems", Proceedings of the 19th IEEE Real-Time Systems Symposium, Madrid, Spain, December 1998.

Carlos Cruz Ribeiro

Phone: (+351) 962360847

E-mail: carlos.ribeiro@tecnico.ulisboa.pt

Scholar ID: XzO-ivMAAAAJ

ORCID: 0000-0002-6080-0996

Author ID: 36642948400

Current position: Associate Professor

Computers

Research unit: INESC-ID

Research interests:

Computer & Network Security.

Selected publications:

- Rui Joaquim, Paulo Ferreira, Carlos Ribeiro, EVIV: An end-to-end verifiable Internet voting system, Computers & Security,32, 170-191, 2013.
- João Lima, Nelson Escravana, Carlos Ribeiro, BPIDS--Using business model specification in intrusion detection RAID'2014, 2014.
- Walter Priesnitz Filho, Carlos Ribeiro, Thomas Zefferer, Privacy-preserving attribute aggregation in eID federations, Future Generation Computer Systems, Volume 92, 2019.

Fernando Mira da Silva

Phone: (+351) 213100205

E-mail: fernando.silva@inesc-id.pt

Scholar ID: bKFCRYYAAAAJ

ORCID: 0000-0001-9959-3798

Author ID: 7102757793

Current position: Assistant Professor

Computers

Research unit: INESC-ID

Research interests:

Machine learning, data mining, computer networks.

Selected publications:

- "Quality of Service Policy Management over a DiffServ Network", International Conference on Telecommunications, 2005.
- F. M. Silva and Luís B. Almeida, "A Distributed Decorrelation Algorithm", Neural Networks: Advances and Applications, E. Gelenbe, Ed., North-Holland, 1991.
- F. M. Silva, L. B. Almeida, "Speeding-Up Backpropagation", International Symposium on Neural Networks for Sensory and Motor Systems, March 1990.

João Ascenso

Phone: (+351) 218418463

E-mail: joao.ascenso@tecnico.ulisboa.pt

Scholar ID: azZf-ewAAAAJ

ORCID: 0000-0001-9902-5926

Author ID: 15845257200

Current position: Assistant Professor

Computers

Research unit: IT

Research interests:

João Ascenso focuses his research on several key areas: Visual Coding: Developing efficient methods for compressing and transmitting all types of visual data, such as emerging 3D representations; Quality Assessment: Evaluating the perceptual quality of multimedia content both subjectively and objectively; Machine Learning for Multimedia Processing: Applying machine learning techniques to enhance multimedia processing tasks, such as super-resolution; Coding for Machines: Creating systems for efficient organization and retrieval of multimedia compressed information; Virtual and Augmented Reality: Exploring technologies and methodologies related to immersive media experiences.

Selected publications:

- F. Jabar, J. Ascenso, M.P. Queluz, "Globally and locally optimized Pannini projection for high FoV rendering of 360° images", Signal Processing: Image Communication, Vol. 129, 2024.
- J. Ascenso, E. Alshina and T. Ebrahimi, "The JPEG AI Standard: Providing Efficient Human and Machine Visual Data Consumption," in IEEE MultiMedia, vol. 30, no. 1, pp. 100-111, 2023.
- A. Javaheri, C. Brites, F. Pereira and J. Ascenso, "Point Cloud Rendering After Coding: Impacts on Subjective and Objective Quality," in IEEE Transactions on Multimedia, vol. 23, pp. 4049-4064, 2021.

João Luís Sobrinho

Phone: (+351) 218418458

E-mail: joao.sobrinho@lx.it.pt

Scholar ID: p0BtQ90AAAAJ

ORCID: 0000-0002-4476-100X

Author ID: 7004507015

Current position: Associate Professor

Computers

Research unit: IT

Research interests:

Research interests in all aspects Computer Networks and the Internet, with emphasis on the rigorous design and analysis of communications protocols. Past work on multiple access for wireless networks. Current work on routing protocols for the Internet with the invention of an algebraic theory that unifies our collective understanding of this important class of protocols. Starting research on traffic aware routing in data-center networks.

Selected publications:

- J. L. Sobrinho and Miguel A. Ferreira, "Routing on Multiple Optimality Criteria," in Proc ACM SIGCOMM, New York, 2020.
- J. L. Sobrinho, Laurent Vanbever, Franck Le, Jennifer Rexford, "Distributed Route Aggregation on the Global Network," in Proc. ACM International Conference on Emerging Networking Experiments and Technologies - (CoNEXT), Australia, 2014
- J. L. Sobrinho, "An Algebraic Theory of Dynamic Network Routing, IEEE/ACM Transactions on Networking," vol. 13, no 5, pp. 1160-1173, October 2005.
- J. L. Sobrinho, A. S. Krishnakumar, "Quality of Service in Ad Hoc Carrier Sense Multiple Access Wireless Networks," IEEE Journal on Selected Areas in Communications, vol. 17, no 8, pp. 1353-1368, August 1999.

João Oliveira e Silva

Phone: (+351) 969006742

E-mail: joao.n.silva@tecnico.ulisboa.pt

Scholar ID: gFAMBDwAAAAJ

ORCID: 0000-0002-7969-5487

Author ID: 22434042700

Current position: Assistant Professor

Computers

Research unit: INESC-ID

Research interests:

My research interest are related to the main area of Distributed Systems. In the subject of mobile computing i have been researching new system organization and programming models for the development of distributed interaction applications. In the area of computer/software system architectures I have been working in the application of system design concepts and use of web technologies in the development of georeferenced and geo-distributed databases. Recently, started researching on the design and development of museology applications, where common concepts such as of web services and distribute systems architectures can be applied to enhance the user experience and ease resources management.

Selected publications:

- Silva, João Nuno, Luís Veiga, and Paulo Ferreira. "Heuristic for resources allocation on utility computing infrastructures." Proceedings of the 6th international workshop on Middleware for grid computing. ACM, 2008.

- Esteves, Sérgio, Joao Silva, and Luís Veiga. "Quality-of-service for consistency of data geo-replication in cloud computing." European Conference on Parallel Processing. Springer, Berlin, Heidelberg, 2012.

- Silva, Joao Nuno, Paulo Ferreira, and Luís Veiga. "Service and resource discovery in cycle-sharing environments with a utility algebra." Parallel & Distributed Processing (IPDPS), 2010 IEEE International Symposium on. IEEE, 2010.

João Paulo Carvalho

Phone: (+351) 213100238

E-mail: joao.carvalho@inesc-id.pt

Scholar ID: Iq5dUwIAAAAJ

ORCID: 0000-0003-0005-8299

Author ID: 7202738810

Current position: Associate Professor

Computers

Research unit: INESC-ID

Research interests:

His current main research interests involve developing and applying new Computational Intelligence techniques to natural language processing, text mining, social network analysis, social sciences and earth sciences. His research results have been applied in projects like Modelling and Simulation of Qualitative Dynamic Systems (economic systems, forest fire simulation, cognitive maps, etc), Fuzzy Fingerprinting for identification and classification in social and medical settings, Improving interpretability and reducing dimensionality of LLMs in classification tasks using Fuzzy Fingerprints, etc.

Selected publications:

- J.P. Carvalho, "On the Semantics and the Use of Fuzzy Cognitive Maps and Dynamic Cognitive Maps in Social Sciences", Fuzzy Sets and Systems, 214(), pp. 6-19, Feb. 2013, Elsevier. Dec. 2010.
- J.P. Carvalho, H. Rosa, G. Brogueira, F.Batista, "MISNIS: An Intelligent Platform for Twitter Topic Mining", Expert Systems With Applications (ESWA), Elsevier, vol. 89, pp. 374-388, 2017
- N. Homem, J. P. Carvalho, Finding top-k elements in data streams, Information Sciences, Vol. 180, No. 24, pp. 4958-4974, Dec. 2010.
- Tiago Sousa, Zita Vale, Joao P. Carvalho, Tiago Pinto, Hugo Morais, A Hybrid Simulated Annealing approach to handle Energy Resource Management considering an intensive use of Electric Vehicles, Energy, Elsevier, vol. 67, pages 81-96, April 2014.

Luís Miguel Silveira

Phone: (+351) 213100337

E-mail: lms@inesc-id.pt

Scholar ID: IMt587kAAAAJ

ORCID: 0000-0003-3542-229X

Author ID: 7004430236

Current position: Full Professor

Computers

Research unit: INESC-ID

Research interests:

Research activity related to the analysis and development of efficient numerical algorithms for design automation problems. Focus has been on various aspects of computer-aided design of integrated circuits with emphasis on parallel computer algorithms and the theoretical and practical issues concerning numerical simulation methods for circuit design problems. Topics have included problems in modeling, extraction and simulation such as timing analysis, variability-aware timing analysis and verification, modeling of frequency-described systems, model order reduction techniques for the analysis of interconnect and packaging effects, modeling and analysis of nonlinear systems, including macromodeling generation, modeling and analysis of massively coupled linear dynamic systems, such as substrate networks or power grids.

Selected publications:

- L. Guerra e Silva, J. R. Phillips, L. Miguel Silveira, "Effective corner-based techniques for variation-aware IC timing verification", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 29, No. 1, pp. 157-162, January 2010.

- J. F. Villena, L. M. Silveira, "SPARE: a scalable algorithm for passive, structure preserving parameter-aware model order reduction", IEEE Transactions on Computer- Aided Design of Integrated Circuits and Systems, Vol. 29, No. 6, pp. 925-938, June 2010.

- J. M. Silva, J. R. Phillips, L. Miguel Silveira, Efficient simulation of power grids, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, Vol. 29, No. 10, pp. 1523-1532, October 2010.

Nuno Horta

Phone: (+351) 218418093

E-mail: nuno.horta@tecnico.ulisboa.pt

Scholar ID: IVjOUCcAAAAJ

ORCID: 0000-0002-1687-1447

Author ID: 6602200012

Current position: Full Professor

Research unit: IT

Computers

Research interests:

Analog and Mixed-Signal IC Design, IC Design Automation Methodologies and Applied Soft Computing as main research areas including subtopics such as Evolutionary Computation, Machine Learning, Intelligent Optimization, System and Device Modeling, Circuit and System Synthesis, Layout Generation, High-Performance Analog, Mixed Signal IC Design and Emerging IC Technologies, Biomedical Applications andComputational Finance.

Selected publications:

- G Liñán-Cembrano, N Lourenço, N Horta, JM de la Rosa, "Design Automation of Analog and Mixed-Signal Circuits Using Neural Networks–A Tutorial Brief", IEEE Transactions on Circuits and Systems II: Express Briefs, 2023.
- Y Zeiträg, JR Figueira, N Horta, R Neves, "Surrogate-assisted automatic evolving of dispatching rules for multi-objective dynamic job shop scheduling using genetic programming", Expert Systems with Applications 2022
- R Martins, N Lourenço, N Horta, S Zhong, J Yin, PI Mak, RP Martins, "Design of a 4.2-to-5.1 GHz ultralow-power complementary class-B/C hybrid-mode VCO in 65-nm CMOS fully supported by EDA tools", IEEE Transactions on Circuits and Systems I: Regular Papers, 2020.
- F. Passos; E. Roca; R. Martins; N. Lourenço; S. Ahyoune; J. Sieiro; R. Castro-López; N. Horta; F. V. Fernández, "Ready-to-Fabricate RF Circuit Synthesis Using a Layout- and Variability-Aware Optimization-Based Methodology," , IEEE Access, 2020
- Simão Moraes Sarmento, Nuno Horta, "Enhancing a Pairs Trading strategy with the application of Machine Learning", Expert Systems with Applications, vol. 158, 2020.

Nuno Miguel Luís

Phone: (+351) 218418454

E-mail: miguel.abreu.luis@tecnico.ulisboa.pt

Scholar ID: Z9pk9BwAAAAJ

ORCID: 0000-0003-3488-2462

Author ID: 36164286400

Current position: Assistant Professor

Computers

Research unit: IT

Research interests:

My research interests are focused on network architectures and protocols for future networks in 5G and on the evolutions towards 6G. Particular interests goes on the management of mobile networks, in the medium access control for wireless systems, routing and dissemination mechanisms for vehicular networks and management, orchestration and softwarization of future networks.

Selected publications:

- A. Figueiredo, P. Rito, M. Luís, S. Sargento, "Enhancing Vehicular Network Efficiency: the Impact of Object Data Inclusion in the Collective Perception Service", in IEEE Open Journal of Intelligent Transportation Systems, vol. 5, 2024.
- D. Dias, M. Luís, P. Rito, S. Sargento, "A Software Defined Vehicular Network using Cooperative Intelligent Transport System Messages", in IEEE Access, vol. 7, 2024.
- R. Oliveira, D. Raposo, M. Luís, P. Rito, S. Sargento, "Optimal Channel Selection for Tri-Band Wi-Fi in a Residential Scenario", in Ad hoc Networks, vol. 160, 2024.
- N. Ferreira, M. Luís, P. Rito, S. Sargento, R. Rosmaninho, "Multihoming in Software Defined Vehicular Networks", in IEEE Vehicular Networking Conference 2024 (VNC 2024), Kobe, Japan, 2024.

Nuno Roma

Phone: (+351) 213100311

E-mail: nuno.roma@tecnico.ulisboa.pt

Scholar ID: iDxEJwIAAAAJ

ORCID: 0000-0003-2491-4977

Author ID: 6602399540

Current position: Associate Professor

Computers

Research unit: INESC-ID

Research interests:

Computer architectures; Specialized and dedicated structures for digital signal processing; Energy-aware computing; High-Performance Computing (HPC) platforms, including parallel processing; Embedded systems design; Multimedia systems (image and video coding).

Selected publications:

- João Vieira, Nuno Roma, Gabriel Falcao, Pedro Tomás, "NDPmulator: Enabling Full-System Simulation for Near-Data Accelerators from Caches to DRAM", IEEE Access, IEEE, vol.12, pp. 10349–10365, 2024.
- Nuno Neves, João Mário Domingos, Nuno Roma, Pedro Tomás, Gabriel Falcão, "Compiling for Vector Extensions with Stream-based Specialization", IEEE Micro, IEEE, vol. 42, n. 5, pp. 49–58, 2022.
- Francisco Mendes, Pedro Tomás, Nuno Roma, "Decoupling GPGPU voltage-frequency scaling for deep-learning applications", Journal of Parallel and Distributed Computing, Elsevier, vol. 165, pp. 32–51, 2022.

Paulo Alexandre Crisóstomo Lopes

Phone: (+351) 213100308

E-mail: paulo.lopes@tecnico.ulisboa.pt

Scholar ID: mAUdr6cAAAAJ

ORCID: 0000-0002-9045-0413

Author ID: 35563033100

Current position: Assistant Professor

Research unit: INESC-ID

Computers

Research interests:

Active Noise Control techniques reduce acoustic noise and vibrations using transducers (ex: speakers) that generate waves of anti-noise with phase opposite to the original noise, reducing the noise level in a given area. The anti-noise signal is generated using sophisticated digital signal processing techniques. Power line communication systems allow the creation of high speed telecommunication networks without the need to had new cables. However the power line channel was not thought for telecommunications use, and requires techniques that can eliminate the high levels of inter-symbolic interference and noise, like digital systems width OFDM or CDMA modulations and noise reduction. In the biochips field, new magnetic sensors arrays and signal processing techniques are being developed with the aim of producing new portable mini laboratories able to make different kinds of clinical analysis and DNA recognition.

Selected publications:

- P. A. C. Lopes, and José AB Gerald. "Careful feedback active noise and vibration control algorithm robust to large secondary path changes." European Journal of Control 75, 2024.
- P. A. C. Lopes and J. A. B. Gerald, Leakage-based precoding algorithms for multiple streams per terminal MU-MIMO systems, Digital Signal Processing vol. 75 pp. 38-44, 2018.

Paulo Pereira

Phone: (+351) 213100345

E-mail: paulo.pereira@tecnico.ulisboa.pt

Scholar ID: sdOt-CcAAAAJ

ORCID: 0000-0002-0192-2504

Author ID: 7202938130

Current position: Assistant Professor

Computers

Research unit: INESC-ID

Research interests:

The research interests cover the generic area of Computer Networks. The topics that raise greater interest are Quality of Service in IP Networks, Differentiated Services, Network Management, Service Level Management and the use of Policies for Network Management, Wireless Sensor Networks and Vehicular Delay-Tolerant Networks.

Selected publications:

- Naércio Magaia, Zhengguo Sheng, Paulo Rogério Pereira, Miguel Correia, REPSYS: A robust and distributed incentive scheme for collaborative caching and dissemination in content-centric cellular-based Vehicular Delay-Tolerant Networks, IEEE Wireless Communications Magazine, Special Issue on Content-Centric Collaborative Edge Caching in 5G Mobile Internet, v.25, n.3, pp.65-71, 2018.

- André dos Santos, Bruno Soares, Chen Fan, Martijn Kuipers, Sérgio Sabino, António Grilo, Paulo Pereira, Mário Nunes, Augusto Casaca, Characterization of Substation Process Bus Network Delays, IEEE Transactions on Industrial Informatics, v. 14, n. 5, pp. 2085-2094, 2018.

- Paulo Rogério Pereira, Augusto Casaca, Joel J. P. C. Rodrigues, Vasco N. G. J. Soares, Joan Triay, Cristina Cervelló-Pastor, From Delay-Tolerant Networks to Vehicular Delay-Tolerant Networks, IEEE Communications Surveys & Tutorials, vol. 14, n. 4, 2012.

Rui Ferreira Neves

Phone: (+351) 214233282

E-mail: rui.neves@tagus.ist.utl.pt

Scholar ID: IjA4tOcAAAAJ

ORCID: 0000-0001-5482-9883

Author ID: 15623594900

Current position: Assistant Professor

Research unit: IT

Computers

Research interests:

Evolutionary computation and pattern matching applied to the financial markets, sensor networks, embedded systems and mixed signal integrated circuits. Using both fundamental, technical and pattern matching indicators to find the evolution of the financial markets.

Selected publications:

- J Nobre, RF Neves, Combining principal component analysis, discrete wavelet transform and XGBoost to trade in the financial markets, Expert Systems with Applications, Vol. 125, pp. 181 - 194, 2019.
- Carapuço, João, Rui Neves, and Nuno Horta. "Reinforcement learning applied to Forex trading." Applied Soft Computing 73, 783-794, 2018.
- M. Daniel, R. Neves, N. Horta, Company Event Popularity for Financial Markets Using Twitter and Sentiment Analysis, Expert Systems with Applications, Vol. 71, No. 0, pp. 111 - 124, 2017.

Rui Rodrigues Rocha

Phone: (+351) 214233225

E-mail: rui.rocha@ist.utl.pt

Scholar ID:

ORCID: 0000-0003-1183-453X

Author ID: 15728426500

Current position: Associate Professor

Research unit: IT

Computers

Research interests:

Management and development of small satellites' projects in the context of IST's NanosatLab; Cyber-physical systems and Edge Computing in Space scenarios.

Selected publications:

- J. P. Monteiro, Rui M. Rocha, A. Silva, R. Afonso, N. Ramos; "Integration and Verification Approach of ISTSat-1 CubeSat", in Aerospace, Vol.6 (12): 131, 2019.
- J. P. Monteiro, et al.; " ISTSat-1, a space-based Automatic Dependent Surveillance-Broadcast demonstration CubeSat mission", in Int J Satell Commun Network. 2022; 40(4): 268- 293, 2022.
- Margarida Reis, Carlos Almeida, Rui M. Rocha; "On the performance of surface electromyography-based onset detection methods with real data in assistive technologies", in Multimedia Tools and Applications.2018; Vol. 77 (9): 11491–11520, 2018.
- J. M. Soares, M. Franceschinis, R. M. Rocha, W. Zhang, M. A. Spirito; "Opportunistic Data Collection in Sparse Wireless Sensor Networks", in EURASIP Journal on Wireless Communications and Networking, Vol. 2011, Article ID 401802, 20 pages, 2011.

Rui Valadas

Phone: (+351) 218417676

E-mail: rui.valadas@tecnico.ulisboa.pt

Scholar ID: 41ZTe9AAAAAJ

ORCID: 0000-0002-7420-4386

Author ID: 7004491344

Current position: Full Professor

Computers

Research unit: IT

Research interests:

Network Routing; Performance Evaluation, Simulation, Optimization, and Statistical Learning for Computer Networks.

Selected publications:

- R. Valadas, “OSPF and IS-IS: from Link State Routing Principles to Technologies”, CRC Press, 2018.
- F. Macedo, M. R. Oliveira, A. Pacheco, R. Valadas, “Theoretical Foundations of Forward Feature Selection Methods based on Mutual Information”, Neurocomputing, 2018.
- C. Pascoal, M. R. de Oliveira, R. Valadas, P. Filzmoser, P. Salvador, A. Pacheco, "Robust Feature Selection and Robust PCA for Internet Traffic Anomaly Detection", INFOCOM 2012, 25-30, Orlando 2012.

Teresa Vazão Vasques

Phone: (+351) 214233242

E-mail: teresa.vazao@tagus.ist.utl.pt

Scholar ID: O0wq5umaaaaj

ORCID: 0000-0002-1953-3160

Author ID: 14038458700

Current position: Associate Professor

Computers

Research unit: INESC-ID

Research interests:

By applying these theoretical advances to neuroscience and biomedicine, I create novel analytical tools for understanding brain dynamics across the health-disease spectrum. This dual focus—theoretical depth paired with clinical relevance—enables the development of more sophisticated personalized medicine approaches and neural interfaces.

Selected publications:

- P. Estrela, T. Vasques, M. Nunes, "Performance Evaluation of the TIMIP/sMIP Terminal Independent Mobile Architecture", Special Issue of HetNet Conference - Next Generation Internet: Performance Analysis and Applications, Wireless Personal , to appear. Kluwer Academy Publishers.

- R. L. Pereira, T. Vasques, R. Rodrigues, "On the Impact of P2P File Sharing Traffic Restrictions on User Perceived Performance", International Conference on Information Networking, 2008.

- A. Varela, T. Vasques, G. Arroz, "An integrated approach to service management in the next generation Internet", EuroFGI Workshop in IP QoS and Traffic Control, IST Press, 2007.

Guilherme Paim

Phone: (+351) 934108508

E-mail: guilherme.paim@inesc-id.pt,

Scholar ID:

ORCID: 0000-0001-7809-9563

Author ID:

Current position: Assistant Professor

Computers

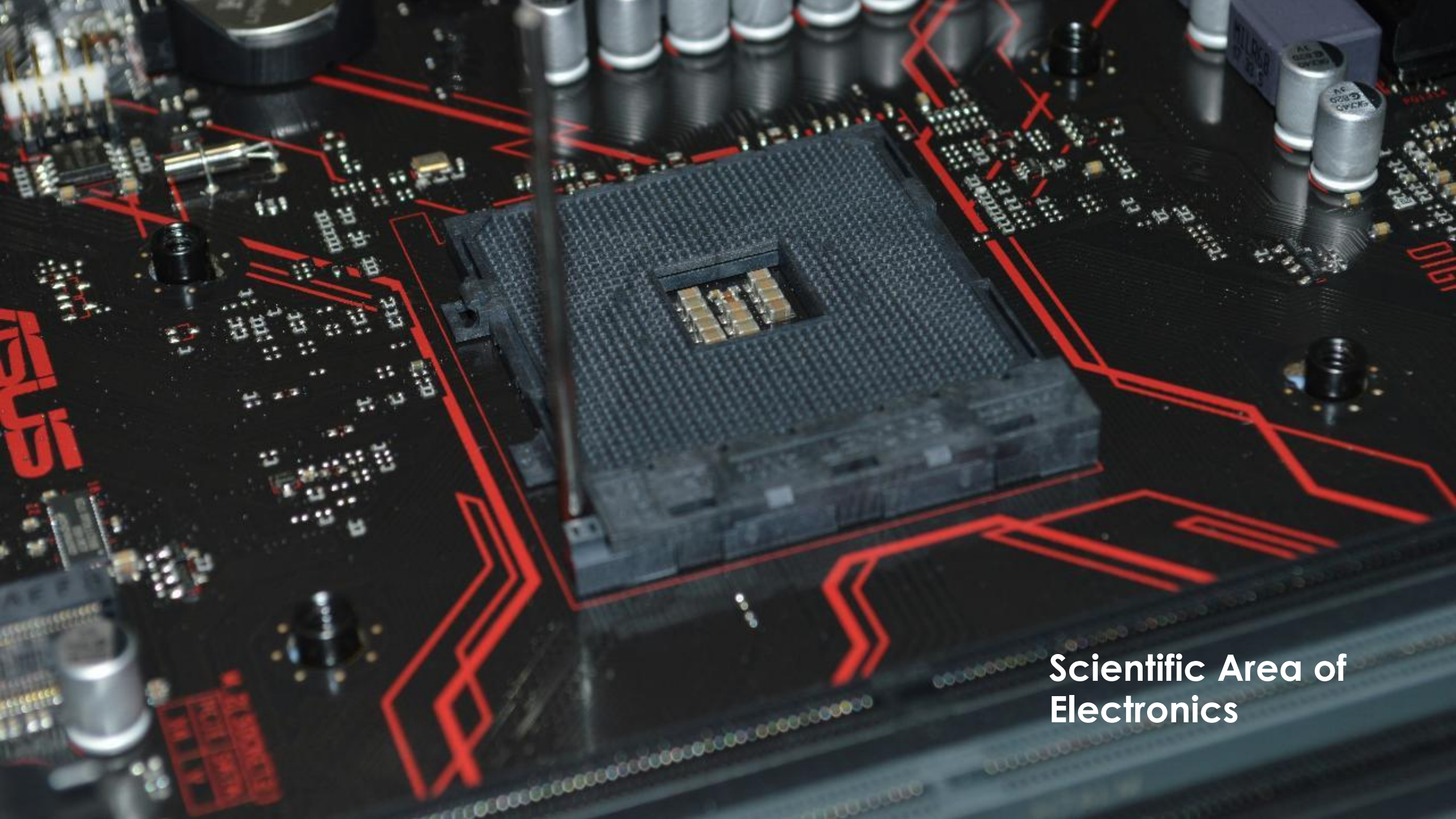
Research unit: INESC-ID

Research interests:

System Level: Artificial Intelligence (AI) System Design, Memory-Aware System Optimization, System-Technology Co-optimization, Computer Architectures; HW: Digital Chip Design, Chiplets, 3DIC RISC-V, System-on-Chip (SoC) Design; SW: Compilers, Real-time Operating Systems (RTOS), Embedded Systems; Application: Artificial Intelligence (AI), Cryptography (Security), Digital Signal Processing (DSP), Video Coding (CODECs).

Selected publications:

- L. M. G. Rocha, M. Naeim, G. Paim, P. Venugopal, D. Milojevic, J. Myers, M. Verhelst, J. Ryckaert, D. Biswas. System-Technology Co-Optimization for Dense Edge Architectures using 3D Integration and Non-Volatile Memory IEEE Journal of Exploratory Solid-State Computational Devices and Circuits vol. 1, 2024 [imec R&D, Qualcomm, Cadence, KU Leuven, IST]
- B. A. Abreu, G. Paim, L. Alrahis, P. Flores, O. Sinanoglu, S. Bampi, H. Amrouch On the Efficacy and Vulnerabilities of Logic Locking in Tree-Based Machine Learning IEEE Transactions on Circuits and Systems, vol. 1, n. 1, 2024.
- X. Yi, R. Antonio, J. Dumoulin, J. V. Delm, J. Sun, G. Paim, M. Verhelst OpenGeMM: A High-Utilization GeMM Accelerator Generator with Lightweight RISC-V Control and Tight Memory Coupling 30th Asia and South Pacific Design Automation Conference (ASP-DAC), 1, vol. 1, IEEE, 2024.
- R. Morales-Monge, J. Castro-Godínez, G. Paim Improving Netlist Transformation-Based Approximate Logic Synthesis Through Resynthesis IEEE Embedded Systems Letters vol. 16, n. 3, 2024.


Scientific Area of
Electronics

António Simões Baptista

Phone: (+351) 218417970

E-mail: baptista@ist.utl.pt

Scholar ID:

ORCID: 0000-0001-8068-7911

Author ID: 7007078935

Current position: Assistant Professor

Research unit:

Electronics

Research interests:

Nonlinear optical properties of semiconductors, opto-electronic semiconductor devices, lasers, laser and optical measurements.

Selected publications:

- Duarte, F., Torres, J.P.N., Baptista, A., Marques Lameirinhas, R.A. Optical nanoantennas for photovoltaic applications Nanomaterials, 11 (2), art. no. 422, pp. 1-25, 2021.
- Marques Lameirinhas, R.A., N. Torres, J.P., Baptista, A., Martins, M.J.M. The impact of nanoantennas on ring resonators' performance, Optics Communications, 490, art. no. 126906, 2021.
- Marques Lameirinhas, R.A., Torres, J.P.N., Baptista, A., Martins, M.J.M. A New Method to Determine the Response of Kretschmann’s Structure Based Biosensors, IEEE Sensors Journal, 2022.
- Lameirinhas, R.A.M., Torres, J.P.N., Baptista, A., Martins, M.J.M. A New Method to Analyse the Role of Surface Plasmon Polaritons on Dielectric-Metal Interfaces, IEEE Photonics Journal, 14 (4), art. no. 2236409, 2022.

Fábio Passos

Phone:

E-mail: fabio.passos@tecnico.ulisboa.pt

Scholar ID:

ORCID: 0000-0002-5638-7377

Author ID:

Current position: Assistant Professor

Electronics

Research unit: INESC-ID

Research interests:

Power Management IC Design, RF/mm-Wave IC Design and Design Automation using AI/ML techniques.

Selected publications:

- F. Passos et al., "PACOSYT: A Passive Component Synthesis Tool Based on Machine Learning and Tailored Modeling Strategies Towards Optimal RF and mm-Wave Circuit Designs," in IEEE Journal of Microwaves, vol. 3, no. 2, pp. 599-613, 2023.

- F. Passos et al., "A Multilevel Bottom-Up Optimization Methodology for the Automated Synthesis of RF Systems," in IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 39, no. 3, pp. 560-571, 2020.

- F. Passos, G. Santos and M. Santos, "A ±0.15 °C (3σ) Inaccuracy CMOS Smart Temperature Sensor from −40 °C to 125 °C with a 10 ms Conversion Time-Leveraging an Adaptative Decimation Filter in 65 nm CMOS Technology", in Electronics, 13, 2823, 2024.

Fernando Duarte Gonçalves

Phone: (+351) 213100350

E-mail: fernando.goncalves@inesc-id.pt

Scholar ID: TEhBdpUAAAAJ

ORCID: 0000-0002-0559-1888

Author ID: 7006464548

Current position: Assistant Professor

Research unit: INESC-ID

Electronics

Research interests:

Reconfigurable architectures for high performance computing. Ethernet communications for electrical substations.

Selected publications:

- J. Cardoso, J. Coutinho, T. Carvalho, P. Diniz, Z. Petrov, W. Luk, F. Gonçalves, "Performance Driven Instrumentation and Mapping Strategies Using the LARA Aspect-Oriented Programming Approach", Software: Practice and Experience, John Wiley & Sons, 2014.

- A. Goerres, R. Bugalho, A. Di Francesco, C. Gastón, F. Gonçalves, G. Mazza, M. Mignone, V. Di Pietro, A. Riccardi, J. Ritman, A. Rivetti, M. D. Rolo, J. C. Da Silva, R. Silva, T. Stockmanns, J. Varela, V. Veckalns, R. Wheadon, "A freerunning, time-based readout method for particle detectors", Journal of Instrumentation, vol. 9, 2014.

- F. Gonçalves (et al.), "LARA Experiments", book chapter "Compilation and Synthesis for Embedded Reconfigurable Systems - An Aspect-Oriented Approach", J.M.P. Cardoso, P.C. Diniz, J.G. de Figueiredo Coutinho, Z.M. Petrov, (eds.), Springer, 2013.

Francisco Corrêa Alegria

Phone: (+351) 218418485

E-mail: falegria@lx.it.pt

Scholar ID: yGMmhDgAAAAJ

ORCID: 0000-0003-0854-489X

Author ID: 6603782254

Current position: Associate Professor

Research unit: IT

Electronics

Research interests:

Characterization of analog to digital converters (ADCs) using different methods (histogram, sinefitting, DFT) and the uncertainty of the estimates made. Study of the influence of additive noise, phase noise, uncertainty on the sampling instant, jitter and frequency error in signal processing methods. Operation and use of measuring instruments. Measurement techniques in the analog and digital domains.

Selected publications:

- F. Corrêa Alegria and A. Cruz Serra, "Automatic Calibration of Analog and Digital Measuring Instruments Using Computer Vision", IEEE Transactions on Instrumentation and Measurement, vol. 49, no. 1, pp. 94-99, 2000.
- F. Corrêa Alegria, "Linearity test of triangular waveform generators", TM. Technisches Messen, vol. 90, no. 10, pp. 683-687, 2023.
- F. Corrêa Alegria, "Precision of Sinewave Amplitude Estimated in the Presence of Additive Noise and Quantization Error", Journal of Electrical Engineering, 2023.
- F F. Corrêa Alegria, "Expanding the IEEE 1057 Standard Jitter Test of Waveform Recorders to Include Simultaneous Voltage Noise Estimation", IEEE Access, vol. 12, pp. 103018-103025, 2024.

Gonçalo Tavares

Phone: (+351) 213100342

E-mail: goncalo.tavares@tecnico.ulisboa.pt

Scholar ID: wfNTfxIAAAAJ

ORCID: 0000-0002-7303-5568

Author ID: 7003985623

Current position: Assistant Professor

Electronics

Research unit: INESC-ID

Research interests:

His main research interests include system architecture for signal processing, statistical signal processing, spread-spectrum systems, synchronization issues in digital communication and algorithms for mobile channel simulation. He is also interested in the investigation of fundamental lower bounds on the MSE or variance of synchronization parameter estimates and its application in digital communications over mobile fading channels.

Selected publications:

- Gonçalo Tavares, On the Statistics of the IEEE 802.11n/ac Fading Channel Models, IEEE Wireless Communications Letters, 5(3), pp. pp. 272 - 27, 2016.
- Gonçalo Tavares, A New Method for Generating Gaussian Random Variates With Clarke's Autocorrelation, IEEE Communications Letters, 18(11), pp. 1899-1902, 2014.
- Gonçalo Tavares and Antonino Petrolino, On the generation of correlated Gaussian random variates by Inverse DFT , IEEE Transactions on Communications, 59(1), pp. 45-51, 2011.

Helena Geirinhas Ramos

Phone: (+351) 218418473

E-mail: hgramos@ist.utl.pt

Scholar ID: BWuHw8EAAAAJ

ORCID: 0000-0002-4931-7960

Author ID: 35571624100

Current position: Associate Professor

Research unit: IT

Electronics

Research interests:

Nondestructive testing, eddy current testing, ultrasound nondestructive testing, sensors and actuators, automated measurement systems, measurements.

Selected publications:

- D.J. Pasadas, M. Barzegar, A.L. Ribeiro, H.G. Ramos, "Crack Depth Evaluation and Imaging Using Lamb Wavefield Measurements by a Movable PZT Sensor," IEEE Sensors Journal, vol. 24, pp. 37514 - 37523, 2024.
- M. Barzegar, D.J. Pasadas, Artur L. Ribeiro, H.G. Ramos, "Comparative Study on Ultrasonic C-scan Imaging of Composite Lap Joints using Piezoelectric Transducer: Pulse-Echo and Pitch-Catch Configurations," IEEE Transactions on Instrumentation & Measurement, vol. 73, pp. 6003310, 2024.
- Mohsen Barzegar, Yevgeniya Lugovtsova, Jannis Bulling, Tatiana Mishurova, Tatiana; Dario Pasadas, Artur Ribeiro, Helena Ramos, "Adhesive Porosity Analysis of Composite Adhesive Joints using Ultrasonic Guided Waves," IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, vol. 71, pp. 485-495, 2024.
- P. Baskaran, A. L. Ribeiro and H. G. Ramos, "Theoretical Predictions of Perturbed Magnetic Flux Density Components Due to Narrow Flaws in ECT," IEEE Transactions on Instrumentation and Measurement, vol. 72, pp. 1-7, 2023.
- B. Feng, Artur L. Ribeiro, Dario J. Pasadas, and Helena Geirinhas Ramos, "Locating Low Velocity Impacts on a Composite Plate Using Multi-Frequency Image Fusion and Artificial Neural Network," Journal of Nondestructive Evaluation, vol. 41, 2022.

Idalina Videira

Phone: (+351)924784155

E-mail: idalina.videira@tecnico.ulisboa.pt

Scholar ID:

ORCID:

Author ID:

Current position: Assistant Professor

Research unit:

Electronics

Research interests:

Main interest is Air Traffic Management Systems.

Worked for 24 years at EUROCONTROL in different aspects of the European ATM Network Air Traffic Management Systems, in software development, software architecture and project management. Awarded with the Single European Sky Innovation Award by the European Commission in 2019. Lately involved in the definition of the European ATM strategical evolution and systems modernization, having participated in the elaboration of European Commission regulations for the European ATM modernization projects.

Selected publications:

- Academic publications are prior to 1999, namely a publication in the 33rd ACM DAC, in 1996:
  I. Videira, H. Sarmento, P. Verissimo, "Efficient Communication in a Design Environment", DAC '96: Proceedings of the 33rd annual Design Automation Conference, pp 179-174, June 1996

  Moved to EUROCONTROL in 1998. Several internal publications, mainly on strategy and evolution of air traffic management systems and presentations in Air Traffic Management Conferences.

João Caldinhas Vaz

Phone: (+351) 218418491

E-mail: joaovaz@ist.utl.pt

Scholar ID: vPLOHz0AAAAJ

ORCID: 0000-0001-5745-3439

Author ID: 22037192400

Current position: Assistant Professor

Electronics

Research unit: IT

Research interests:

Monolithic integrated LC voltage controlled oscillators (VCO) with differential and quadrature outputs. Quadrature VCOs/Mixers on 0.35um CMOS technology. Frequency synthesizers for frequencies up to 6GHz on CMOS technology. Power amplifiers for WLAN applications on 0.35um CMOS technology. Spiral inductors modeling and electromagnetic simulation on SiGe and CMOS technologies. Electric models were obtained up to 6GHz. Poly capacitors and resistors modeling. Electric models were obtained up to 6GHz. Grounded and floating active inductors for 5GHz on SiGe 0.35um process.

Selected publications:

- L. Mendes, E. J. Pires, J. C. Vaz, M. J. Rosário, P. B. Oliveira, J. A. Machado, "Automated Design of Microwave Discrete Tuning Differential Capacitance Circuits in Si Integrated Technologies", Microwave and Optical Technology Letters, Wiley, Vol. 52, No. 3, 2010.

- E. J. Pires, L. Mendes, P. B. Oliveira, J. A. Machado, J. C. Vaz, M. J. Rosário. "Design of Radio-Frequency Integrated CMOS Discrete Tuning Varactors Using the Particle Swarm Optimization Algorithm", Lecture Notes in Computer Science, Springer, No. 5518, pp. 1231-1239, 2009.

- L. Mendes, E. J. Pires, P. B. Oliveira, J. A. Machado, N. M. Ferreira, J. C. Vaz and M. J. Rosário. "Design Optimization of Radio Frequency Discrete Tuning Varactors", LNCS, Springer, no. 5484, pp. 343-352, 2009.

Jorge Fernandes

Phone: (+351) 213100327

E-mail: jorge.fernandes@inesc-id.pt

Scholar ID: WiXsQE0AAAAJ

ORCID: 0000-0002-4916-5637

Author ID: 35569928800

Current position: Associate Professor

Research unit: INESC-ID

Electronics

Research interests:

My current research interests include analog, mixed signal and RF integrated circuits design, with an emphasis on techniques for applications in extreme environments.

Selected publications:

- S. Liu, T. Rabuske, J. Paramesh, L. Pileggi, J. Fernandes, Analysis and Background Self-Calibration of Comparator Offset in Loop-Unrolled SAR ADCs , IEEE Trans. on Circuits and Systems I, Online 2017.
- T. Rabuske, J. Fernandes, A SAR ADC with a MOSCAP-DAC", IEEE Journal of Solid-State Circuits, Vol:51 , N.6, pp. 1410 1422, 2016.
- M. Crepaldi, C. Li, J. Fernandes, P. Kinget, "An Ultra-Wideband Impulse-Radio Transceiver Chipset Using Synchronized-OOK Modulation" IEEE Journal of SolidState Circuits Vol. 46, No. 10, pp. 2284-2299, 2011.

José Epifânio da Franca

Phone:

E-mail: josedafranca@tecnico.ulisboa.pt

Scholar ID:

ORCID: 0000-0003-3227-1270

Author ID: 6603959337

Current position: Full Professor

Research unit:

Electronics

Research interests:

Analog and Mixed-Signal VLSI.

Selected publications:

- Circuit design for wireless communications: improved techniques for image rejection in wideband quadrature receivers KP Pun, JE Da Franca, C Azeredo-Leme, Springer Science & Business Media 34 2013.
- Systematic Design for Optimisation of Pipelined ADCs, J Goes, JC Vital, JE Franca, Springer Science & Business Media 38 2006.
- Design of very high-frequency multirate switched-capacitor circuits: extending the boundaries of CMOS analog front-end filtering. U Seng-Pan, BUS Pan, RP Martins, JE da Franca, Springer Science & Business Media 10 2006.

José Teixeira de Sousa

Phone: (+351) 213100215

E-mail: jose.desousa@inesc-id.pt

Scholar ID:

ORCID: 0000-0001-7525-7546

Author ID: 7102813024

Current position: Assistant Professor

Research unit: INESC-ID

Electronics

Research interests:

Methods and techniques for rapid design, implementation and verification of complex hardware/software systems.

Selected publications:

- J. Sousa, P. Cheung, "Boundary-Scan Interconnect Diagnosis", Springer Netherlands, 2001.
- J. Sousa, R. Zuim, C.N. Coelho, "Decision heuristic for Davis Putnam, Loveland and Logemann algorithm satisfiability solving based on cube subtraction", IET Computers & Digital Techniques, Vol. 2, No. 1, 2008.
- A. Bhalla, J. Sousa, I. Lynce, J. Marques da Silva, "Heuristic-Based Backtracking Relaxation for Propositional Satisfiability", Journal of Automated Reasoning, Vol. 35, No. 1, 2005.

Leonel Sousa

Phone: (+351) 213100210

E-mail: las@inesc-id.pt

Scholar ID: Xw4F4y0AAAAJ

ORCID: 0000-0002-8066-221X

Author ID: 7004775548

Current position: Full Professor

Research unit: INESC-ID

Research interests:

Electronics

His research interests include High Performance Computing, Micro-architectures for General Purpose and Specialized Processors, and Multimedia Systems. During the last ten years he has been investigating efficient algorithms and architectures to develop efficient processing systems.

Selected publications:

- Aleksandar Ilic, Frederico Pratas and Leonel Sousa. Beyond the Roofline: Cacheaware Power and Energy-Efficiency Modeling for Multi-cores, IEEE Transactions on Computers, IEEE, vol. 66, n. 1, pp. 52-58, 2017.
- Aleksandar Ilic, Frederico Pratas and Leonel Sousa. Cache-aware Roofline model: Upgrading the loft, IEEE Computer Architecture Letters, IEEE, vol. 13, n. 1, pp. 21- 24, 2014.
- O. Sinnen, L. Sousa, F. Sandnes, "Towards a Realistic Task Scheduling Model", IEEE Transactions on Parallel and Distributed Systems, Vol. 17, No. 3, 263-275, 2006.

Luís Granadeiro Rosado

Phone: (+351) 968438868

E-mail: luis.rosado@tecnico.ulisboa.pt

Scholar ID: r77XcUAAAAAJ

ORCID: 0000-0001-8928-510X

Author ID: 56728979600

Current position: Assistant Professor

Research unit:

Electronics

Research interests:

My research interests are mostly related to electromagnetic sensors design, and to mixed signal electronics and signal processing. More specifically, the carried research has focused on the design of sensors and electronic systems with a unique holistic approach which resulted in several innovations and achieved specifications that could not be met by those elements individual optimization. This research is answering industrial needs such as the quality control on additive manufacturing processes and emerging societal challenges as the detection/characterization of microplastic particles in water streams.

Selected publications:

- L. Rosado, F. Cardoso, S. Cardoso, P. Ramos, P. Freitas, M. Piedade, “Eddy currents testing probe with magneto-resistive sensors and differential measurement”, Sensors and Actuators A, vol. 212, pp. 58-67, 2014.
- A. Barrancos, M. Pyekh, L. Rosado, “Metallic Surfaces Binary Reconstruction using Eddy Current Sensors and Convolutional Neural Networks”, IEEE Sensors, vol. 24, 2024.
- A. Barrancos, V. Luz, L. Rosado, "Microplastics Detection with Microfluidic Near-Field Microwave Sensors," 2024 IEEE 22nd Mediterranean Electrotechnical Conference (MELECON), Porto, Portugal, 2024.

Marcelino Bicho dos Santos

Phone: (+351) 213100288

E-mail: marcelino.santos@ist.utl.pt

Scholar ID: ZlmBiE4AAAAJ

ORCID: 0000-0002-2091-1165

Author ID: 7402562421

Current position: Associate Professor

Electronics

Research unit: INESC-ID

Research interests:

Mixed signal integrated circuits design: ultra low power circuits, linear voltage regulators, switched voltage regulators, voltage and current reference circuits, testability analysis and design for testability.

Selected publications:

- A. Monteiro, M. Santos, A. Neves, N. Dias, "Noise Minimization for Low Power Bandgap Reference and Low Dropout Regulator Cores", Journal of Low Power Electronics, JOLPE, 5(2), pp. 206-222, American Scientific, 2009.
- N. Dias, M. Bicho dos Santos, A. Monteiro, A. Neves, "Gate Driver Voltage Optimization for Multi-Mode Low Power DC-DC Conversion", Journal of Low Power Electronics, JOLPE, 5(2), pp. 241-254, 2009.
- M. Santos, J. M. Dores Costa, J. Rocha, F. Lima, "Level Shifters and DCVSL for a Low Voltage CMOS 4.2V Buck Converter", IEEE Transactions on Industrial Electronics, Volume 55, Issue 9, pp. 3315 – 3323, 2008.

Paulo Flores

Phone: (+351) 213100399

E-mail: paulo.flores@tecnico.ulisboa.pt

Scholar ID: usmU1KIAAAAJ

ORCID: 0000-0003-2970-3589

Author ID: 56357901100

Current position: Associate Professor

Research unit: INESC-ID

Electronics

Research interests:

Research areas: Computer architecture; Embedded systems design; Reconfigurable computing using FPGAs; Approximating computing.

Expertise in: Design of optimized and dedicated computing architectures (FPGA/SoC accelerators); Design and synthesis of digital circuits from hardware description languages such as VHDL/Verilog, SystemC, or generic programming languages (C/C++), targeting FPGA (Filed Programmable Gate Arrays) technologies. Usage of RISC-V soft-core processors and associated ecosystems in FPGAs. Architectures for Neural Networks implementations in hardware.

Selected publications:

- Yuri Arbeletche, Guilherme Paim, Brunno Abreu, Sérgio Almeida, Eduardo Costa, Paulo Flores, Sergio Bampi, "MAxPy: A Framework for Bridging Approximate Computing Circuits to Its Applications,". IEEE Transactions on Circuits and Systems II: Express Briefs, 71(11):4748-4752, 2024.

- F. Pavanello et al., "NEUROPULS: NEUROmorphic energy-efficient secure accelerators based on Phase change materials aUgmented siLicon photonicS,". IEEE European Test Symposium (ETS), pp. 1-6, 2023,

- Levent Aksoy, Paulo Flores, José Monteiro, "Exact and approximate algorithms for the filter design optimization problem". IEEE Transactions on Signal Processing, 63(1):142-154, 2015

Pedro Miguel Ramos

Phone: (+351) 218418485

E-mail: pedro.m.ramos@tecnico.ulisboa.pt

Scholar ID: Mus9z00AAAAJ

ORCID: 0000-0001-8914-9781

Author ID: 7103233161

Current position: Associate Professor

Electronics

Research unit: IT

Research interests:

Main research areas: (i) Measurement of Battery Impedance Spectroscopy for State-of-Charge (SOC) and State-of-Health (SOH) estimation; (ii) Least-Squares Fitting of acquired data for the estimation of signal parameters which can be used in many fields of instrumentation and measurement, system identification and signal processing and includes sine-fitting, multiharmonic fitting and ellipse fitting algorithms; (iii) Impedance Measurements with the development of simple techniques based on least-squares algorithms to accurately measure the impedance parameters using analog to digital converters and signal processing techniques; (iv) Measurement of Power Quality Disturbances with the development of new signal processing techniques for the efficient and correct detection and classification of power quality disturbance events.

Selected publications:

- P. Arpaia, M. Buzio, A, Parrella, M. Pentella, P. M. Ramos, "A static-sample magnetometer for characterizing weak magnetic materials", IEEE Transactions on Instrumentation and Measurement, vol. 70, n.º 6003309, pp. 1-9, 2021.

- Nuno M. Rodrigues, Fernando M. Janeiro, Pedro M. Ramos "Deep learning for power quality event detection and classification based on measured grid data", IEEE Transactions on Instrumentation and Measurement, vol. 72, n.º 9003311, pp. 1 - 11, 2023.

- Gabriele Cicioni, Alessio De Angelis, Fernando M. Janeiro, Pedro M. Ramos, Paolo Carbone, "Battery impedance spectroscopy embedded measurement system", Batteries, vol. 9, n.º 12, 577, 2023.

Pedro Bonifácio Vitor

Phone: (+351) 218417667

E-mail: pvitor@mail.ist.utl.pt

Scholar ID:

ORCID: 0000-0002-2944-7717

Author ID:

Current position: Assistant Professor

Research unit:

Research interests:

Electronics

Selected publications:

- P. R. B. Vitor, "Radiação Electromagnética dos Telemóveis – Recomendações Baseadas na Evidência", Revista Saúde e Bem Estar, Nº 109, pp. 120-123, 2003.
- K. W. Tam, P. Vitor, R. P. Martins, "MMIC active filter with tuned transversal element", IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing, vol. 45, pp. 632-634, 1998.
- K. W. Tam and P. Vitor, "Vehicle Alarm Positioning Based Upon Pager/UHF Communications and GPS Systems", Part V chapter contribution in Advances in Information Technologies: The business Challenge, IOS Press, 1997.

Pedro Tomás

Phone: (+351) 213100212

E-mail: pedro.z.tomas@tecnico.ulisboa.pt

Scholar ID: BQzcauwAAAAJ

ORCID: 0000-0001-8083-4432

Author ID: 24473659300

Current position: Associate Professor

Electronics

Research unit: INESC-ID

Research interests:

I am mostly interested in general-purpose and specialized computer architectures and systems, with particular emphasis on energy-efficiency, as well as on data streaming infrastructures to mitigate the memory wall of modern computing systems. In particular, I develop work on reconfigurable and heterogeneous architectures and computing systems with low-power and high-performance constraints, as well as in parallel programming computing models and techniques. I am also interested in performance, power, and energy models that can be used to adapt an architecture or computing system in runtime, such as by regulating voltage and/or frequency, by turning on/off computing cores and other hardware structures, or by controling the running threads.

Selected publications:

- J. M. Domingos, N. Neves, N. Roma, P. Tomás. "Unlimited Vector Extension with Data Streaming Support", ACM/IEEE 48th Annual International Symposium on Computer Architecture (ISCA), 2021.

- J. Guerreiro, A. Ilic, N. Roma, P. Tomás, "GPGPU Power Modeling for Multi-Domain Voltage-Frequency Scaling", In 24th International Symposium on High-Performance Computer Architecture (HPCA'2018), IEEE, pp. 789-800, Vienna, Austria, 2018.

- P. Duarte, P. Tomas, G. Falcao. "SCRATCH: an end-to-end application-aware soft-GPGPU architecture and trimming tool." In 50th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO'2017), ACM, pp. 165-177, Bostan, USA, 2017.

Ricardo Martins

Phone: (+351) 916004684

E-mail: ricmartins@lx.it.pt

Scholar ID: BQQtw4MAAAAJ

ORCID: 0000-0002-8251-1415

Author ID: 55963115200

Current position: Assistant Professor

Electronics

Research unit: IT

Research interests:

Electronic design automation for analog, mixed-signal, radio-frequency and millimeter wave integrated circuits and systems. Deep nanometer integration technologies. Applied soft computing, machine and deep learning.

Selected publications:

- R. Martins, and N. Lourenço, "Analog Integrated Circuit Routing Techniques: An Extensive Review," in IEEE Access, vol. 11, 2023.
- A. Gusmão, R. Póvoa, N. Horta, N. Lourenço, and R. Martins, "DeepPlacer: A Custom Integrated OpAmp Placement Tool using Deep Models," in Applied Soft Computing, Elsevier, vol. 115, 108188, 2022.
- L. Mendes, J. Vaz, F. Passos, N. Lourenço, and R. Martins, "In-depth Design Space Exploration of 26.5-to-29.5-GHz 65-nm CMOS Low-Noise Amplifiers for Low-Footprint-and-Power 5G Communications using One-and-Two-Step Design Optimization", in IEEE Access, vol. 9, pp. 70353 – 70368, 2021.
- R. Martins, N. Lourenço, R. Póvoa, and N. Horta, "Shortening the Gap between Pre- and Post-Layout Analog IC Performance by Reducing the LDE-induced Variations with Multi-Objective Simulated Quantum Annealing," in Engineering Applications of Artificial Intelligence, vol. 98, 104102, 2021.

Teresa Mendes de Almeida

Phone: (+351) 213100379

E-mail: TeresaMAlmeida@tecnico.ulisboa.pt

Scholar ID: TWs2MCUAAAAJ

ORCID: 0000-0002-0270-5739

Author ID: 55939208000

Current position: Assistant Professor

Electronics

Research unit: INESC-ID

Research interests:

Main interests include: analog and digital processing systems, analog and digital signal processing techniques, design and implementation of filters using different technologies, phase locked loops and their applications, analysis and modeling of systems and devices, analysis and synthesis of electrical and electronic circuits. My work aims to bridge the gap between abstract mathematical frameworks and tangible medical benefits, ultimately working toward enhanced quality of life through improved therapeutic interventions and brain-machine interfaces. This research pathway combines the precision of control theory with the complexity of neural systems to advance both our fundamental understanding and our clinical capabilities.

Selected publications:

- T. M. Almeida, M. Piedade, L. Sousa, J. Germano, P. Lopes, F. Cardoso, P. Freitas, On the Modeling of New Tunnel Junction Magnetoresisitive Biosensors, IEEE Transactions on Instrumentation and Measurement, vol.59, n.1, pp.92-100, 2010.
- T. M. Almeida, M. Piedade, From DPLL Design to its Implementation on a FixedPoint DSP, European DSP Education & Research Symposium, pp.215-222, Texas Instruments, 2008.
- T. M. Almeida, M. Piedade, High performance analog and digital PLL design, IEEE International Symposium on Circuits and Systems, pp.394-397, vol.4, 1999.


Scientific Area of Energy

Célia Cardoso de Jesus

Phone: (+351) 218417705

E-mail: celiaj@ist.utl.pt

Scholar ID:

ORCID: 0000-0002-4837-2095

Author ID: 54880874900

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

I have been doing research in the field of power system analysis, with special emphasis on network analysis. Network analysis is becoming increasingly important as the transmission and distribution networks become more vulnerable to a new kind of demands. With the increasing penetration of renewable resources into distribution and transmission networks together with an increase in the demand for power reliability, the networks need to be better planned and better operated. The planning and operations became more computer dependent, as a result of an additional availability of observation data. In fact the optimization and control, so necessary for planning and operation, require a fast reliable analysis module. Power Flow Equations based on Tellegen's Theorem when used in a reduced local model are a new and appropriate solution in this context.

Selected publications:

- C. Jesus, Loss Sensitivity Formulas by Adjoint Networks, Electric Power Systems Research, 2010.
- C. Jesus, L. M. Ferreira, "Complete adjoint-based incremental power flow equations", Electric Power Systems Research, Vol. 79, No. 7, 2009.
- C. Jesus, "Power System Voltage Sensitivities by Adjoint Networks", WSEAS Transactions on Circuits and Systems, Vol. 5, No. 2, 2006.

Duarte de Mesquita e Sousa

Phone: (+351) 218417429

E-mail: duarte.sousa@ist.utl.pt

Scholar ID: PQmypWEAAAAJ

ORCID: 0000-0003-3519-205X

Author ID: 6701686403

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

Development of power supplies and magnets to specific applications: i) NMR – FFC relaxometer, designing FFC magnets based on superconducting materials and using computational optimization techniques; and, implementing power supplies fulfilling the FFC NMR requirements; ii) Electrical systems to the Transports domain: development of hybrid energy storage solutions and electric drive trains of electric vehicles (based on the usage of ultracapacitors and high capacity batteries).

Selected publications:

- Duarte M. Sousa: "Specific Aspects of the Design of Field-cycling Devices", Fieldcycling NMR Relaxometry: Instrumentation, Model Theories and Applications (Chapter 5), pp. 118-137, The Royal Society of Chemistry, Editor Rainer Kimmich, 2019.

- António Roque; Duarte M. Sousa; Elmano Margato; Victor Maló Machado; Pedro J. Sebastião; G. D. Marques: "Magnetic Flux Density Distribution in the Air Gap of a Ferromagnetic Core with superconducting Blocks: Three-Dimensional Analysis and Experimental NMR Results", IEEE Transactions on Applied Superconductivity, Vol. 25, No. 6, Art. ID 4301609, 2015.

- G. D. Marques, Duarte M. Sousa, Matteo F. Iacchetti: "Air-Gap Power-Based Sensorless Control in a DFIG Connected to a DC Link", IEEE Transactions on Energy Conversion, Vol. 30, No. 1, pp. 365-375, 2015.

Eduardo Rodrigues

Phone:

E-mail: eduardo.g.rodriguestecnico.ulisboa.pt

Scholar ID: JrZHm0IAAAAJ

ORCID: 0000-0002-4589-5341

Author ID: 57192667259

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

My research interests are: smart energy systems; dc and ac microgrids; power electronics for power grid applications and industrial applications; industrial automation.

Selected publications:

- Eduardo M.G. Rodrigues: "Robust model-based control and stability analysis of PMSM drive with DC-link voltage and parameter variations, Results in Control and Optimization" Volume 17, 2024.
- Eduardo M.G. Rodrigues: "A novel method for fault diagnosis in photovoltaic arrays used in distribution power systems" Energy Syst, 2024.

Hugo Morais

Phone:

E-mail: hugo.morais@tecnico.ulisboa.pt

Scholar ID:

ORCID: 0000-0001-5906-4744

Author ID: 21834170800

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

Distributed Energy Resources Management; Electric Vehicles; Demand Response.

Selected publications:

- W. van Ackooij, S. Demassey, P. Javal, H. Morais, W. de Oliveira and B. Swaminathan, "A bundle method for nonsmooth DC programming with application to chance-constrained problems", Computational Optimization and Applications, Accepted for publication.
- Tiago Soares, Leonel Carvalho, Hugo Morais, Ricardo J. Bessa, and Eric Lambert, "Reactive Power Provision by the DSO to the TSO considering Renewable Energy Sources uncertainty", Sustainable Energy, Grids and Networks, 2020.
- Tiago Pinto, Hugo Morais, Juan Corchado, "Adaptive Entropy-based Learning with Dynamic Artificial Neural Network", Neurocomputing, 2019.

João Filipe Pereira Fernandes

Phone: (+351) 968 811 445

E-mail: joao.f.p.fernandes@tecnico.ulisboa.pt

Scholar ID: vO-hsMQAAAAJ

ORCID: 0000-0002-9674-5490

Author ID: 56804334500

Current position: Assistant Professor

Energy

Research unit: IDMEC

Research interests:

His current research interests include: the use of superconducting materials in electromechanical systems to increase its power density; The application of Vanadium-Cobalt alloys in electrical machines; The exploration of cryogenic machines; Operation of induction generators when isolated from the power grid and under variable speed in the pump as working turbines (PATs); Design and optimization of electrical machines to increase their specific-power.

Selected publications:

- Arsénio Costa, António J., João F. P. Fernandes, and Paulo J. Costa Branco."Axial Stiffness Augmentation by Adding Superconductor Bulks or Limiting Permanent Magnet Rings to a Horizontal Axis Zero-Field Cooled High-Tc Radial Passive Superconducting Bearing" Actuators 13, no. 6: 196, 2024.

- L. F. D. Bucho, F. F. da Silva, J. F. P. Fernandes and P. J. C. Branco, "Electromechanical Analysis of HTS Cage Rotors for Induction-Synchronous Machines," in IEEE Transactions on Applied Superconductivity, vol. 34, no. 3, pp. 1-5, 2024.

- Ramos, Helena M., Modesto Pérez-Sánchez, Prajwal S. M. Guruprasad, Armando Carravetta, Alban Kuriqi, Oscar E. Coronado-Hernández, João F. P. Fernandes, Paulo J. Costa Branco, and Petra Amparo López-Jiménez. 2024. "Energy Transition in Urban Water Infrastructures towards Sustainable Cities" Water 16, no. 3: 504.

Maria Eduarda Pedro

Phone: (+351) 218417711

E-mail: d2527@ist.utl.pt

Scholar ID: Zg1tCVMAAAAJ

ORCID: 0000-0002-5919-6891

Author ID: 7202362564

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

Transmission line modelling; Electric and magnetic fields originated by power lines (overhead lines and underground cables); Magnetic field mitigation techniques for power lines.

Selected publications:

- Neuza Gomes, M., Almeida, M.E., Maló Machado, V.; "Series-Impedance and Losses of Magnetic Field Mitigation Plates for Underground Power Cables", IEEE Trans. on Electromagnetic Compatibility, Vol. 60, No.6, pp. 1761-1768, 2018.
- Camilo, Fernando, Castro, Rui, Almeida, M.E., Fernão Pires, V.; "SelfConsumption and Storage as a Way to Facilitate the Integration of Renewable Energy in Low Voltage Distribution Networks", IET Generation, Transmission and Distribution, Vol. 10, No. 7, pp. 1741-1748, 2016.
- Brito, Ana Isabel, Maló Machado, V., Almeida, M.E., Guerreiro das Neves, M.; "Skin and Proximity Effects in the Series-Impedance of Three-Phase Underground Cables", Electric Power Systems Research, Vol. 130, pp. 132-138, 2016.

Maria José Resende

Phone: (+351) 218417165

E-mail: mresende@ist.utl.pt

Scholar ID: Q4Ssqe8AAAAJ

ORCID: 0000-0001-5838-1342

Author ID: 7005936078

Current position: Assistant Professor

Energy

Research unit: INESC-ID

Research interests:

Main factors constraining transformers' thermal loss of life are load and ambient temperature profiles they experience. Provided a suitable transformer thermal model and a loss of life one are chosen, it is possible, from a theoretical point of view, to determined its on-line expected loss of life. However, due to the random character of constrains, such a purely deterministic approach will lead to reduced reliability results. The physical characteristics of the real profiles that transformers are subjected to (deterministic and random), and the uncertainty associated to transformer's specific parameters used in its thermal model, require a probabilistic approach for the study of expected loss of life. The electric engineering is a difficult discipline both to learn and teach. It requires from the students, a higher level of abstraction than in other disciplines. The appearance of communication and information technologies (TIC) allows de development of teaching tools which objective is to improve de efficiency of the learning process.

Selected publications:

- M. J. Resende, P. Rocha, F. Silva, G. Marques, F. Pimenta, D. Mesquita, S. Pinto, J. Santana, "Advanced Training Course in Power Quality; A Case Study", 18th EAEEIE Conference, Praha, 2007.
- M. J. Resende, L. Pierrat, J, Santana, "The Transformer Thermal Loss of Life: Part 1 - Improved Deterministic Approach for Thermal and Ageing Models", ETEP, Vol. 13, 2003.
- M. J. Resende, L. Pierrat, J. Santana, "The Transformer Thermal Loss of Life: Part 2 - Influence of Functional and Structural Parameters' Variability. A Probabilistic Approach", accepted for publication on the ETEP.

Paulo Branco

Phone: (+351) 218417432

E-mail: pbranco@tecnico.ulisboa.pt

Scholar ID: bPz3GeYAAAAJ&hl

ORCID: 0000-0002-7072-5184

Author ID: 7005118618

Current position: Full Professor

Energy

Research unit: IDMEC

Research interests:

Expertise in: Design of optimized and dedicated computing architectures (FPGA/SoC accelerators); Design and synthesis of digital circuits from hardware description languages such as VHDL/Verilog, SystemC, or generic programming languages (C/C++), targeting FPGA (Filed Programmable Gate Arrays) technologies. Usage of RISC-V soft-core processors and associated ecosystems in FPGAs. Architectures for Neural Networks implementations in hardware.

Selected publications:

- Ferreira da Silva, F.; Fernandes, J.F.P.; da Costa Branco, P.J. Superconducting Electric Power Systems: R&D Advancements. Energies 2022, 15, 7350.
- Fernandes, J.F.P.; Bhagubai, P.P.C.; Branco, P.J.C. Recent Developments in Electrical Machine Design for the Electrification of Industrial and Transportation Systems. Energies 2022, 15, 6390.
- Bhagubai, Pedro P.C., Luís F.D. Bucho, João F.P. Fernandes, and P. J. Costa Branco. "Optimal Design of an Interior Permanent Magnet Synchronous Motor with Cobalt Iron Core" Energies, vol. 15, no. 8: 2882, 2022.

Pedro Carvalho

Phone: (+351) 218417706

E-mail: pcarvalho@ist.utl.pt

Scholar ID: q3Ao_30AAAAJ

ORCID: 0000-0001-5472-7617

Author ID: 35179007100

Current position: Full Professor

Energy

Research unit: INESC-ID

Research interests:

Power systems planning, operation and analysis. Robust optimization algorithms and advanced computer applications for large-scale distribution networks. Risk assessment, design for reliability, and power quality. Embedded generation and smart grids.

Selected publications:

- L Xie, P M S Carvalho, L A F M Ferreira, J Liu, B H Krogh, N Popli, M D Ilic, "Wind Integration in Power Systems: Operational Challenges and Possible Solutions," Proceedings of the IEEE, Vol. 99, No. 1, 2011.
- P M S Carvalho, P. F. Correia, L A F M Ferreira, "Distributed Reactive Power Generation Control for Voltage Rise Mitigation in Distribution Networks," IEEE Transactions on Power Systems, Vol. 23, No. 2, 2008.
- P M S Carvalho, L A F M Ferreira, A M F Dias, "Distribution grids of the future: Planning for flexibility to operate under growing uncertainty," Foundations and Trends in Electric Energy Systems, Vol. 2, No. 4, 2018.

Rui Castro

Phone: (+351) 218417287

E-mail: rcastro@tecnico.ulisboa.pt

Scholar ID: oIRnXSkAAAAJ

ORCID: 0000-0002-3108-8880

Author ID: 55937371000

Current position: Full Professor

Energy

Research unit: INESC-ID

Research interests:

Power Systems, Renewable Energy, Storage, Electrical Vehicles, Hydrogen, Demand Response.

Selected publications:

- Florentin Eckl, Ana Moita, Rui Castro, Rui Costa Neto, Valorization of the by-product oxygen from green hydrogen production: A review, Applied Energy, 2025,
- Carlos Santos Silva, Diogo Couceiro, Rui M.G. Castro, The role of pumped hydro storage in the Portuguese National Plan for energy and climate for 2030: A hybrid approach using Energy PLAN and machine learning, Journal of Energy Storage, 2024,
- Raquel Pereira, Hugo Morais, Rui Castro, Optimising Portugal's 2050 energy system: Electric vehicles and hydrogen integration using Grey Wolf Optimiser and EnergyPLAN, Energy, 2024,

Sónia Ferreira Pinto

Phone: (+351) 218417299

E-mail: soniafp@tecnico.ulisboa.pt

Scholar ID: DaB7f1gAAAAJ

ORCID: 0000-0003-3266-7881

Author ID: 7005324770

Current position: Associate Professor

Energy

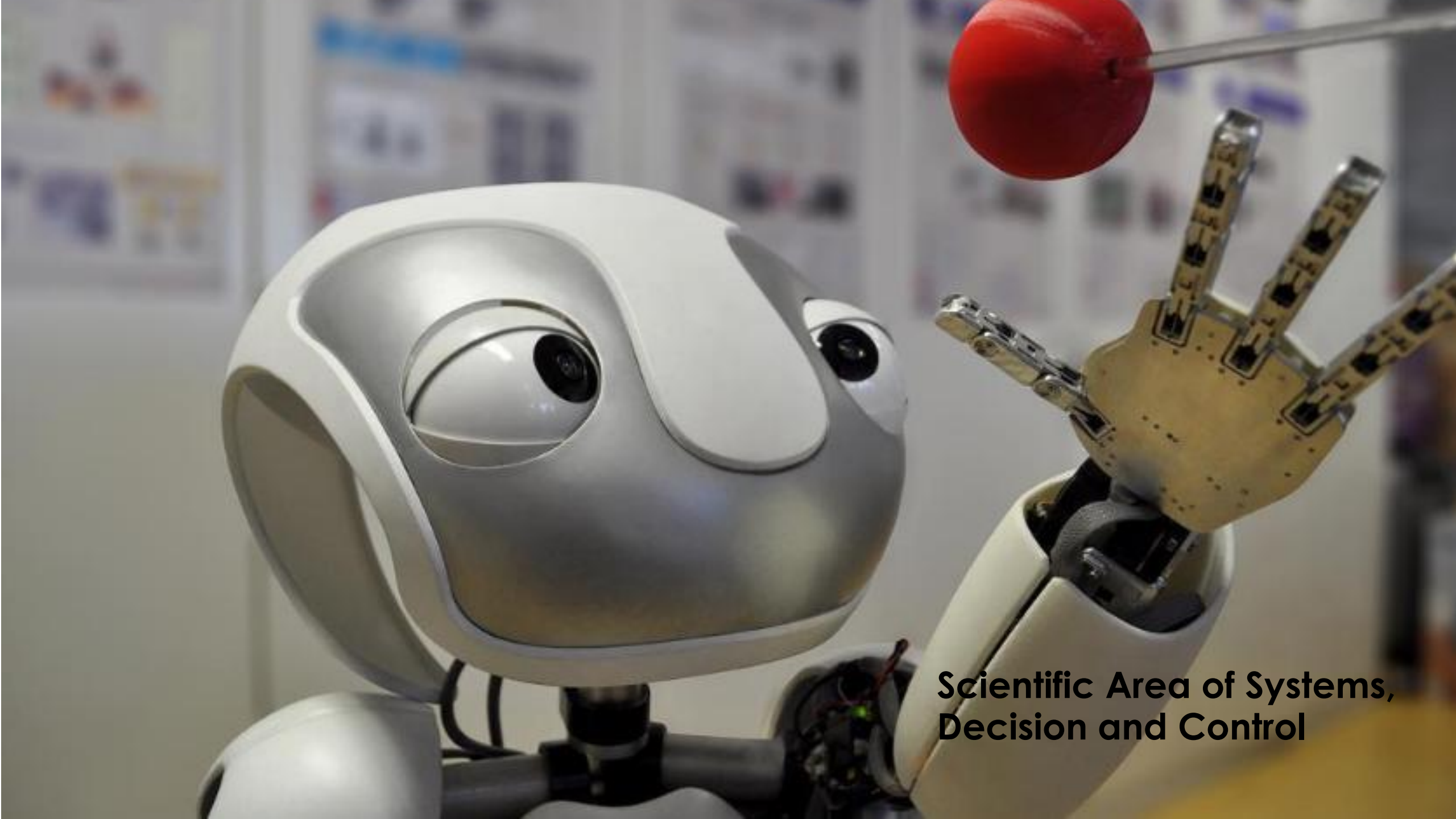
Research unit: INESC-ID

Research interests:

My research interests are focused on AC and DC microgrids, smart transformers for sustainable grids, power electronic converter topologies and control for renewable energy and energy storage applications.

Selected publications:

- L. Zhang, A. Bento, G. Paraíso, P. Costa, S.F. Pinto, J.F. Silva, F. Wang, “Multiple modularity topology for smart transformers based on matrix converters”, IET Electric Power Applications, Vol. 16, No. 8, pp. 926–940, April 2022. pp. 189 – 200, 2016.
- Costa, G. Paraíso, S.F. Pinto, J.F. Silva, "A four-leg matrix converter based hybrid distribution transformer for smart and resilient grids", Electric Power Systems Research, Elsevier, Vol. 203, 2022.
- A. Bento, G. Paraíso, P. Costa, L. Zhang, T. Geury, S.F. Pinto, J.F. Silva, “On the potential contributions of matrix converters for the future grid operation, sustainable transportation and electrical drives innovation", Applied Sciences, 11 (10), 4597.


Scientific Area of Systems,
Decision and Control

Alberto Vale

Phone: (+351) 218419098

E-mail: avale@ipfn.tecnico.ulisboa.pt

Scholar ID: YnxM7bIAAAAJ&hl

ORCID: 0000-0003-3423-3905

Author ID: 36680986500

Current position: Assistant Professor

Systems, Decision and Control

Research unit: IPFN

Research interests:

Research interests include the following topics related to unmanned ground vehicles and unmanned aerial vehicles: guidance, navigation and control (GNC), cooperative robotics, simultaneous localization and mapping (SLAM), artificial intelligence, application of mobile robots in industry, nuclear fusion facilities and fighting against Chemical, Biological, Radiological, Nuclear, and high yield Explosives (CBRNe) threats.

Selected publications:

- L. Marques, R. Coito, T. Costa, S. Fernandes, A. Vale and P. Vaz, "Radioactive Source Localization Using a Mobile Radiation Detection System Featuring Informed Path-Based Decisions," in IEEE Transactions on Nuclear Science, vol. 71, no. 5, pp. 1064-1071, 2024.

- R. Bettencourt, J. Lewis, R. Serra, M. Basiri, A. Vale and P. U. Lima, "GEERS: Georeferenced Enhanced EKF Using Point Cloud Registration and Segmentation," in IEEE Robotics and Automation Letters, vol. 9, no. 2, pp. 1803-1810, 2024.

- Vale, A., Ventura, R., Corisco, J., Catarino, N., Veiga, N., & Sargento, S.. Heterogeneous drone fleet for radiological inspection. In Unmanned Aerial Vehicles Applications: Challenges and Trends (pp. 127-168). Cham: Springer International Publishing, 2023.

Alexandre Bernardino

Phone: (+351) 218418293

E-mail: alex@isr.ist.utl.pt

Scholar ID: auFmh9MAAAAJ

ORCID: 0000-0003-3991-1269

Author ID: 7003407125

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

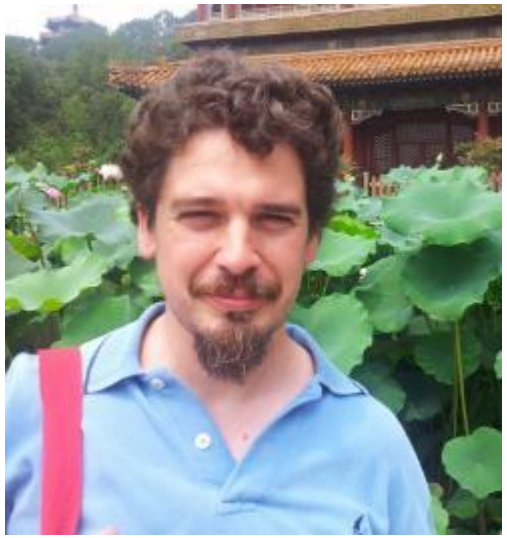
My main research interests are the development of real-time artificial vision methods for applications in robot control and surveillance, including both the low-level (tracking, filtering, visual servoing) and high-level aspects (decision, learning, development). To allow real-time operation, some complexity management mechanisms must be considered. In particular, I've been interested in how the human visual system deals with complexity both by morphological design (space-variant retina) and by cognitive development (attentional mechanisms). Being a multi-disciplinary area, it benefits not only from contributions from the exact sciences (mathematics, engineering, computer science), but also from biology, neurosciences and psychological sciences, where connections have been established along the years.

Selected publications:

- Learning Object Affordances: From Sensory Motor Maps to Imitation, Luis Montesano, Manuel Lopes, Alexandre Bernardino, and Jose Santos-Victor. IEEE Transactions on Robotics, Special Issue on Bio-Robotics, Vol 24(1), 2008.

- A review of log-polar imaging for visual perception in robotics, Javier Traver, Alexandre Bernardino, Robotics and Autonomous Systems, Vol 58(4):378-398, 2010.

- Matrix Completion for Weakly-supervised Multi-label Image Classification. R. Cabral, F. de La Torre, J. Costeira, A. Bernardino. PAMI, 37(1):121-135, 2015.



André Martins

Phone: (+351) 218418454

E-mail: andre.t.martins@gmail.com

Scholar ID: mT7ppvwAAAAJ

ORCID: 0000-0003-3991-1269

Author ID: 57199760504

Current position: Associate Professor

Research unit: IT

Research interests:

Natural Language Processing, Machine Learning, Deep Learning.

Systems, Decision and Control

Selected publications:

- André F. T. Martins and Ramon Astudillo. "From Softmax to Sparsemax: A Sparse Model of Attention and Multi-Label Classification." International Conference on Machine Learning (ICML'16), New York, USA, 2016.
- André F. T. Martins, Mário A. T. Figueiredo, Pedro M. Q. Aguiar, Noah A. Smith, Eric P. Xing. "AD3: Alternating Directions Dual Decomposition for MAP Inference in Graphical Models." Journal of Machine Learning Research, 16(Mar): 495--545, 2015.
- André F. T. Martins, Marcin Junczys-Dowmunt, Fábio Kepler, Ramon Astudillo, Chris Hokamp and Roman Grundkiewicz. "Pushing the Limits of Translation Quality Estimation." Transactions of the Association for Computational Linguistics, 5: 205--218, 2017.

Carlos Gomes Bispo

Phone: (+351) 218418282

E-mail: cfb@isr.ist.utl.pt

Scholar ID:

ORCID: 0000-0001-9481-204X

Author ID: 6603412149

Current position: Assistant Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My main interests lie on the determination of classes of decision policies for networks of queues that insure them to be stable. The main tools used are Markov Decision Processes and Infinitesimal. Perturbations Analysis. In the area of Inventory Control I intend to derive processes to determine non strict priorities for decision problems in the context of multi-product with capacity bounds. In the area of Scheduling I have specific interests in Train Traffic Management for low traffic segments. In Optimal Control I intend to work on decentralized methodologies for large dimension problems with specific applications to networks of channels and reservoirs for water distribution. There are also interests on the application of operations management tools and methodologies to specific portuguese contexts, like the national health system, the justice system, and the public administration in general, with particular emphasis on local governement.

Selected publications:

- C. Bispo, "Managing simple re-entrant flow lines: Theoretical foundation and experimental results", IIE Transactions, Vol. 33, No. 8, 2001.
- C. Bispo, "An echelon inventory based single stage cost function for a two station tandem system",Production Planning & Control, Vol. 10, No. 7, 1999.
- C. Bispo, "Production planning and scheduling using a fuzzy decision system", IEEE Transactions on Robotics and Automation, Vol. 10, No. 2, 1994.

Carlos Silvestre

Phone: (+351) 218418052

E-mail: cjs@isr.tecnico.ulisboa.pt

Scholar ID: DEbK7o8AAAAJ

ORCID: 0000-0002-5096-5527

Author ID: 56962772800

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

Carlos Silvestre research interests include linear and nonlinear control and estimation theory; hybrid systems; multi-agent control systems; networked control systems; inertial navigation systems and real time architectures for complex autonomous systems with application to unmanned air and underwater vehicles.

Selected publications:

- Pedro Casau, Ricardo G. Sanfelice, Carlos Silvestre, Hybrid Stabilization of Linear Systems with Reverse Polytopic Input Constraints, IEEE Transactions on Automatic Control, Volume 61, Issue 12, Pages 6473-6480, 2017.

- Daniel Silvestre, Paulo Rosa, João P. Hespanha, Carlos Silvestre, Stochastic and Deterministic Fault Detection for Randomized Gossip Algorithms, Automatica, Volume 78, Issue 4, Pages 46–60, 2017.

- Pedro Pereira, Rita Cunha, David Cabecinhas, Carlos Silvestre, Paulo Oliveira, Leader Following Trajectory Planning: A Trailer-Like Approach, Automatica, Volume 75, Issue 1, Pages 77–87, 2017.

Catarina Barata

Phone: (+351) 218418270

E-mail: ana.c.fidalgo.barata@tecnico.ulisboa.pt

Scholar ID: lR7eJboAAAAJ

ORCID: 0000-0002-2852-7723

Author ID: 57205913749

Current position: Invited Assistant Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research interests are machine learning, with a particular focus on weakly and self-supervised methods, and computer vision. My dual background has influenced my line work, which is mostly related with two human-centered applications: i) health and ii) safety. I am trying to bridge the gap between the society and new machine-learning based technologies. To achieve this goal, I am exploring the capabilities of deep learning approaches to learn patterns from image data, such that this information may be used in a variety of applications: medical image analysis models that collaborate with physicians to reach better diagnostic performances; advance the research in the cancer therapy field, through the close collaboration with molecular researchers and oncologists; motion analysis in human surveillance data, to identify abnormal behaviors; and iv) fire detection using images from unmaned vehicles, which can be used to improve the fire fighting capabilties.

Selected publications:

- C. Barata, M.E. Celebi, and J.S. Marques " Explainable Skin Lesion Diagnosis Using Taxonomies" accepted for publication in Pattern Recognition, 2020

- C. Barata, J. C. Nascimento, J. M. Lemos, and J. S. Marques “Sparse Motion Fields for Trajectory Prediction”, accepted for publication in Pattern Recognition, 2020.

- C. Barata, M. Ruela, M. Francisco, T. Mendonça, and J. S. Marques, “Two systems for the detection of melanomas in dermoscopy images using texture and color features”, IEEE Systems Journal, vol. 8,no. 3, pp. 965-979, 2014.

João Miranda Lemos

Phone: (+351) 213100259

E-mail: joao.lemos@inesc-id.pt

Scholar ID: 4fCQkLcAAAAJ

ORCID: 0000-0003-3149-8035

Author ID: 56236520700

Current position: Full Professor

Research unit: INESC-ID

Systems, Decision and Control

Research interests:

The research interests are concerned with control of uncertain systems. For this sake, tools from adaptive control are used, with emphasis on the use of methods combining adaptation and predictive control, switched multiple model control and adaptation based on Lyapunov functions. Applications range from "technical systems" such as thermoelectric power systems and water distribution systems (either in canals or pipes) to biomedical applications, including the control of anesthesia and HIV-1 infection. Decentralized control is another major area of interest that expands the previous ones.

Selected publications:

- B.Costa, J. Miranda Lemos, An adaptive temperature control law for a solar furnace, Control Engineering Pratice -Elsevier, Vol. 17, No. 10, pp. 1157-1173, 2009.
- T. Mendonça, J. Miranda Lemos, H. Magalhães, P. Rocha, S. Esteves, Drug delivery for neuromuscular blockade with supervised multimodel adaptive control, IEEE Transactions on Control Systems Technology, Vol. 17 No. 6, pp. 1097-1103, 2009.
- C. S. Nunes, T. Mendonça, J.Miranda Lemos, P. Amorim, Feedforward adaptive control of the Bispectral Index of the EEG using the intravenuous anaesthestic drug propofol, International Journal of Adaptive Control and Signal Processing, Vol. 23, No. 5, 2009.

João Costeira

Phone: (+351) 218418292

E-mail: jpc@isr.ist.utl.pt

Scholar ID: Xi33QRIAAAAJ

ORCID: 0000-0001-6769-2935

Author ID: 6602787568

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My scientific interests are in the area of Image Understanding with a special "pleasure" for 3D reconstruction from video. In the past few years I centered my activities in developing efficient algorithms and representations for point correspondence and structure-from-motion. I'm interested in object recognition and localization applications. I have been involved in several projects in the area of robotics, image/information retrieval and indexing. Quite often these problems lead to large-scale combinatorial optimization problems, therefore I have developed strong collaborations with the mathematics and signal processing community. This work lead to fundamental results in "data association" mechanisms over linear subspaces. Hinging on these results I'm interested in tackling recognition/matching problems in very large sets of distributed image databases having in mind applications in mobile sensing, quality of life technology and robotics in general.

Selected publications:

- J. Maciel, J.P. Costeira, A Global Solution to Sparse Correspondence Problems, IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 25, No. 2, 2003.
- M. Marques, J. P. Costeira, Estimating 3D shape from degenerate sequences with missing data, Computer Vision and Image Understanding, Vol. 113, No. 2, pp. 261- 272 , 2009.
- J.P. Costeira, T. Kanade, A Multibody Factorization Method for Independent Moving Objects, International Journal on Computer Vision, Vol. 29, No. 3, 1998.

João Silva Neto

Phone: (+351) 213100315

E-mail: joao.neto@inesc-id.pt

Scholar ID:

ORCID:

Author ID:

Current position: Assistant Professor

Systems, Decision and Control

Research unit: INESC-ID

Research interests:

Our research is being developed along two main lines: the semantic processing of multimedia information and the development of spoken dialogue systems. In the *semantic processing of multimedia information* line we have been working in the development of techniques for characterizing the acoustic signal extracted from multimedia data. With this characterization we are able to generate metadata to represent the contents of that data. This metadata can be represented semantically in order to generate an adequate indexing and access to the multimedia information. In this characterization we generate information as speech/non-speech, background, and speaker gender segment classification, we transcribe speaker turn segments through our /AUDIMUS.//MEDIA/ speech recognition system, and we are using acoustic and prosodic cues to help segmenting the transcriptions in sentences. In the development of *spoken dialogue systems* our specific aim is to build multimodal input interface to the system.

Selected publications:

- J. Neto, H. Meinedo, M. Viveiros, R. Cassaca, C. Martins, D. Caseiro, "Broadcast News Subtitling System in Portuguese", IEEE International Conference on Acoustics, Speech and Signal processing, 2008.
- H. Meinedo, M. Viveiros, J. Neto, "Evaluation of a Live Broadcast News Subtitling System for Portuguese", Interspeech 2008, 2008.
- C. Martins, A. Teixeira, J. Neto, "Dynamic Language Modeling for European Portuguese", Computer Speech & Language, 2010.

João Gomes

Phone: (+351) 218418296

E-mail: jpg@isr.ist.utl.pt

Scholar ID: etvZNs4AAAAJ

ORCID: 0000-0002-3524-5556

Author ID: 7203010999

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

Localization algorithms and positioning systems for sensor networks, as well as indoor, underwater and other GPS-denied environments. Signal and information processing in networks and large-scale data sets. Fast and parallel filtering and estimation algorithms. Underwater acoustic and optical communications. Array processing methods in underwater acoustics. Channel estimation and equalization over severely dispersive transmission media.

Selected publications:

- B. Ferreira, J. Gomes, C. Soares, J Costeira, FLORIS and CLORIS: Hybrid source and network localization based on ranges and video, Signal Processing (Elsevier), vol. 153, pp. 355-367, 2018.
- C. Soares, J. Gomes, B. Ferreira, J. Costeira, "LocDyn: Robust distributed localization for mobile underwater networks", IEEE Journal of Oceanic Engineering, vol. 42, no. 4, pp. 1063-1074, 2017.
- C. Soares, J. Xavier, J. Gomes, "Simple and fast convex relaxation method for cooperative localization in sensor networks using range measurements", IEEE Transactions on Signal Processing, vol. 63, no. 17, pp. 4532-4543, 2015.

João Silva Sequeira

Phone: (+351) 218418057

E-mail: jseq@isr.ist.utl.pt

Scholar ID: 7oJqjtYAAAAJ

ORCID: 0000-0002-6706-5365

Author ID: 7006523955

Current position: Assistant Professor

Research unit: ISR

Research interests:

Social Robotics. Human-Robot Interaction. Modeling and control of nonsmooth systems.

Systems, Decision and Control

Selected publications:

- Jorge Silva, João Sequeira, Cristina Santos. "A robot control architecture supported on contraction theory". International Journal of Systems Science, 2016.
- Fernando Alonso-Martín, María Malfaz, João Sequeira, Javier F. Gorostiza, Miguel A. Salichs. "A Multimodal Emotion Detection System during Human-Robot Interaction". Sensors Journal, vol 13, 2013.
- J. Sequeira, Antonios Tsourdos, Samuel Lazarus. "Robust covariance estimation for data fusion from multiple sensors". IEEE Transactions on Instrumentation and Measurement, 10(12), 2011

João Xavier

Phone: (+351) 218418296

E-mail: jxavier@isr.ist.utl.pt

Scholar ID: 04aoCmQAAAAJ

ORCID: 0000-0002-9669-8532

Author ID: 7007007263

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My main research area is signal processing on manifolds. This includes modeling, filtering, parametric estimation bounds, Riemannian centroid computation, manifold learning, smooth and nonsmooth optimization, etc.

Selected publications:

- J. Xavier, H. Manton, "On the generalization of AR processes to Riemannian manifolds", IEEE International Conference on Acoustics, Speech and Signal Processing, 2006.
- R. Ferreira, J. Xavier, J. P. Costeira and V. Barroso, "Newton method for Riemannian centroid computation in naturally reductive homogeneous spaces", IEEE International Conference on Acoustics, Speech and Signal Processing, 2006
- M. Beko, J. Xavier and V. Barroso, "Codebook design for non-coherent communication in multiple-antenna systems", IEEE International Conferenceon Acoustics, Speech and Signal Processing, 2006.

Jorge Marques

Phone: (+351) 218418297

E-mail: jsm@isr.tecnico.ulisboa.pt

Scholar ID: 8Vwg-7sAAAAJ

ORCID: 0000-0002-3800-7756

Author ID: 7203033359

Current position: Full Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research interests are in the area of model-based image analysis. I wish to answer the question: how to extract information from images, using statistical models learned from the data. I have been involved in several applications: shape analysis, heart tracking, skin cancer detection, detection of structures in planetary images, recognition of human activities and video surveillance. I am also very interested on how to teach such topics to students.

Selected publications:

- C. Barata, M.E. Celebi, J. S. Marques, A Survey of Feature Extraction in Dermoscopy Image Analysis of Skin Cancer, IEEE Journal of Biomedical and Health Informatics, 2018.
- C. Barata, M. E. Celebi, J. S. Marques, "Development of Clinically Oriented System for Melanoma Diagnosis", Pattern Recognition, 69, 270-285, 2017.
- J. Nascimento, M. Figueiredo, J. S. Marques, "Activity recognition using mixture of vector fields", IEEE Trans. on Image Processing, Vol. 22, 1712- 1725, 2013.

José Gaspar

Phone: (+351) 218418293

E-mail: jag@isr.ist.utl.pt

Scholar ID: iVM2NhkAAAAJ

ORCID: 0000-0002-9502-2151

Author ID: 7006015443

Current position: Assistant Professor

Systems, Decision and Control

Research unit: ISR

Research interests:

Research interests in the areas of Computer and Robot Vision, specially in the fields of 3D information recovery, Obstacle detection and Visual self-localisation for mobile robots. Worked/working areas: Omnidirectional Vision; Mobile Robots' Visual Self-Localisation and Navigation; Ground plane obstacle detection (GPOD); Surface reconstruction; Stereo matching based on Edge Features.

Selected publications:

- N. Monteiro, S. Marto, J. Barreto, J. Gaspar, "Depth range accuracy for plenoptic cameras", Computer Vision and Image Understanding (CVIU, Journal), ISSN 1077- 3142, Vol.168, pp.104-117, 2018.
- R. Galego, A. Ortega, R. Ferreira, A. Bernardino, J. Andrade-Cetto, J. Gaspar, "Uncertainty analysis of the DLT-Lines calibration algorithm for cameras with radial distortion", Computer Vision and Image Understanding (CVIU) Vol.140, pp.115-126, Elsevier, 2015.
- E. Grossmann, J. Gaspar, F. Orabona, "Discrete camera calibration from pixel streams", Computer Vision and Image Understanding (CVIU), Vol.114, Issue 2, pp.198-209, February 2010.

José Santos-Victor

Phone: (+351) 218418294

E-mail: jasv@isr.tecnico.ulisboa.pt

Scholar ID: ZMuNAXQAAAAJ

ORCID: 0000-0002-9036-1728

Author ID: 7003525618

Current position: Full Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research focusses on cognitive robots, learning, and computer vision, with the twin goal of (i) developing artificial (robotic) systems that use vision to perceive their surroundings and (ii) modeling and understanding the biological vision and cognition (mostly insects and humans). We use vision for mapping and control of land, air and underwater vehicles, including the design of specialized, bio-inspired "eye" geometries (e.g. compound eyes, foveal cameras). I work closely with neuroscientists and psychologists to investigate human sensorimotor coordination, learning, and cognition. Key areas of this research include studying the role of mirror neurons in action understanding and imitation learning, as well as modeling object affordances for manipulation, language grounding, and tool use. The ultimate goal is to create robotic systems with enhanced learning and adaptation capabilities. I have coordinated the design of the Baltazar anthropomorphic robot, the social robot Vizzy, and led the IST team that designed the head of the the iCub, the most advanced open-source humanoid robot in the world.

Selected publications:

- Dimitrios Dimou, José Santos-Victor, Plinio Moreno, "Robotic hand synergies for in-hand regrasping driven by object information", Autonomous Robots, 2023.
- A.Dehban, S.Zhang, N.Cauli, L.Jamone, J.Santos-Victor, "Learning Deep Features for Robotic Inference from Physical Interactions," IEEE Transactions on Cognitive and Developmental Systems, 2022
- B.Silva, l.Santos, C.Barata, A.Geminiani, G.Fassina, A.R.Gonzalez, S.Ferreira, B.Barahona-Corrêa, I. Olivieri, A. Pedrocchi, J.Santos-Victor, "Attention Analysis in Robotic-Assistive Therapy for Children with Autism", IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2024.

Luís Caldas de Oliveira

Phone: (+351) 213100355

E-mail: luis.oliveira@inesc-id.pt

Scholar ID: ZlqnYZoAAAAJ

ORCID: 0000-0002-9024-2200

Author ID: 7201790344

Current position: Assistant Professor

Systems, Decision and Control

Research unit: INESC-ID

Research interests:

My main area of research is speech processing, specifically speech production and synthesis with special emphasis on applications to European Portuguese. Speech processing is a very multidisciplinary research area whose goal is to develop systems with which a person can interact naturally, in her own language, using the full range of linguistic, para-linguistic and non-linguistic information conveyed in the speech signal. This requires large amounts of linguistic resources for the given language and that was part of the work performed by myself and others at the speech group of INESC during the late 90's. The current focus is now on speech-to-speech translation systems and spoken dialogue systems with multi-modal interfaces using digital agents modelled as humanlike characters exhibiting personality and emotion. This advanced applications imposes new domains in the speech production process, namely the modeling of emotive and spontaneous speech. My current research interests include automatic multi-level speech annotation for speech synthesis using variable-length units and voice source modification for emotional speech synthesis.

Selected publications:

- D. Silva, L. Oliveira, M. Andrea, "Jitter Estimation Algorithms for Detection of Pathological Voices", EURASIP Journal on Advances in Signal Processing, 2009.
- S. Paulo, L. C. Oliveira, "MuLAS: A Framework For Automatically Building MultiTier Corpora", Interspeech, ISCA, 2007.
- J. P. Cabral, L. Oliveira, "EmoVoice: a System to Generate Emotions in Speech", Interspeech, ISCA, 2006.

Luís Marques Custódio

Phone: (+351) 218418272

E-mail: luis.custodio@isr.tecnico.ulisboa.pt

Scholar ID: e85RuU0AAAAJ

ORCID: 0000-0001-9632-8171

Author ID: 6602677229

Current position: Assistant Professor

Research unit: ISR

Research interests:

Systems, Decision and Control

Artificial Intelligence (AI) and Robotics, namely knowledge representation and reasoning under uncertainty, machine learning, representational tools for decision-making under uncertainty (e.g., partially observable markov decision processes, bayesian networks) and multi-agent systems.

Selected publications:

- Lima P., Custódio L., Multi-Robot Systems, Chapter I of Innovations in Robot Mobility and Control, S. Patnaik, S. Tzafestas (Eds.). Springer Verlag, Berlin, 2006.
- Oliveira e Sousa, C. and Custódio, L., "Dealing with Errors in a Cooperative Multiagent Learning System", in "Learning and Adaption in Multi- Agent Systems", Editors: Karl Tuyls, Pieter Jan t Hoen, Katja Verbeeck, Sandip Sen, Lecture Notes in Computer Science, Volume 3898, pp. 139-154, Springer, 2006.
- Salvado J., Custódio L., and Hess D., "Contingency Planning for Automated Vehicles", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016), 2016.

Manuel Marques

Phone:

E-mail: Manuel@isr.tecnico.ulisboa.pt

Scholar ID:

ORCID: 0000-0003-0532-1869

Author ID: 7201744198

Current position: Assistant Researcher

Systems, Decision and Control

Research unit: ISR

Research interests:

I'm interested in computer vision, machine learning, optimization, and image processing. In particular, my research is about inferring the shape of physical world from images.

Selected publications:

- M Costa, CL Azevedo, FW Siebert, M Marques, F Moura, Unraveling the relation between cycling accidents and built environment typologies: Capturing spatial heterogeneity through a latent class discrete outcome model, Accident Analysis & Prevention 200, 107533, 2024.
- J Celestino, M Marques, JC Nascimento, JP Costeira, 2D Image head pose estimation via latent space regression under occlusion settings, Pattern Recognition 137, 109288, 2023.

Margarida Silveira

Phone: (+351) 218418297

E-mail: msilveira@isr.tecnico.ulisboa.pt

Scholar ID: 399732wAAAAJ

ORCID: 0000-0001-7777-3675

Author ID: 7007111760

Current position: Assistant Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research interests are in the area of image processing, computer vision, machine learning and deep learning.

Selected publications:

- C Cabral, PM Morgado, DC Costa, M Silveira, Predicting conversion from MCI to AD with FDG-PET brain images at different prodromal stages, Computers in biology and medicine, 58, 2015
- M. Silveira, S. Heleno, "Separation between Water and Land in SAR Images", IEEE Geoscience and Remote Sensing Letters, Vol. 6, No. 3, 2009.
- M. Silveira, J. Nascimento, J. S. Marques, A. R. S. Marçal, T. Mendonça, S. Yamauchi, J. Maeda, J. Rozeira, "Comparison of Segmentation Methods for Melanoma Diagnosis in Dermoscopy Images", IEEE Journal of Selected Topics in Signal Processing, 3(1), 2009.

Paulo Ramalho Oliveira

Phone: (+351) 218418053

E-mail: paulo.j.oliveira@tecnico.ulisboa.pt

Scholar ID: V97jzbwAAAAJ

ORCID: 0000-0002-5799-390X

Author ID: 55751743873

Current position: Full Professor

Research unit: IDMEC

Research interests:

Systems, Decision and Control

Integration of Mechatronic Systems, Autonomous Robotic Vehicles, Sensor Fusion, Navigation, Guidance and Control Systems.

Selected publications:

- J. F. Vasconcelos, G. Elkaim, C. Silvestre, P. Oliveira and B. Cardeira, "Geometric Approach to Strapdown Magnetometer Calibration in Sensor Frame," in IEEE Transactions on Aerospace and Electronic Systems, vol. 47, no. 2, pp. 1293-1306, 2011.

- A. Pascoal, P. Oliveira, C. Silvestre, et al., "Robotic ocean vehicles for marine science applications: the European ASIMOV project," OCEANS 2000 MTS/IEEE Conference and Exhibition. Conference Proceedings (Cat. No.00CH37158), Providence, RI, USA, 2000, pp. 409-415 vol.1.

- A. Alcocer, P. Oliveira, A. Pascoal, "Study and implementation of an EKF GIBbased underwater positioning system," Control Engineering Practice, Volume 15, Issue 6, 2007.

Pedro Batista

Phone: (+351) 218418056

E-mail: pbatista@isr.tecnico.ulisboa.pt

Scholar ID: 6eon48IAAAAJ

ORCID: 0000-0001-6079-0436

Author ID: 55751743873

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research interests include dynamic systems, control, and estimation theory with application to control and navigation of single and multiple autonomous vehicles in the marine, aerial, and space domains.

Selected publications:

- Leonardo Pedroso and Pedro Batista, Distributed decentralized receding horizon control for very large-scale networks with application to satellite mega-constellations, Control Engineering Practice, vol. 141, 105728, 2023.
- Pedro Trindade, Pedro Batista, and Rita Cunha, Third-Order Consensus for Robust Distributed Formation Control of Double Integrator Vehicles, Control Engineering Practice, vol. 133, 105436, 2023.
- Pedro Cruz and Pedro Batista, A solution for the attitude determination of three-vehicle heterogeneous formations, Aerospace Science and Technology, vol. 93, 105275, 2019.

Pedro Aguiar

Phone: (+351) 218418283

E-mail: aguiar@isr.tecnico.ulisboa.pt

Scholar ID: 6HVq8KMAAAAJ

ORCID: 0000-0002-3809-8416

Author ID: 36014956700

Current position: Associate Professor

Research unit: ISR

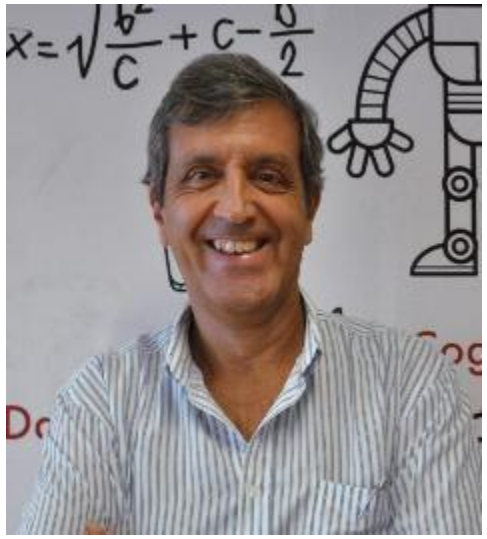
Systems, Decision and Control

Research interests:

My research interests are within signal and image analysis. In particular, my goal is to make computers extract high level content by seeking the simplest interpretation of signals and images.

Selected publications:

- L. Pato, R. Negrinho, and P. Aguiar, "Seeing without Looking: contextual rescoring of object detections for AP maximization", IEEE Conf. on Computer Vision and Pattern Recognition, 2020.
- J. Crespo and P. Aguiar, "Revisiting Complex Moments for 2D Shape Representation and Image Normalization", IEEE Trans. on Image Processing, 2011.
- P. Aguiar and J. Moura, "Rank 1 Weighted Factorization for 3D Structure Recovery", IEEE Trans. on Pattern Analysis and Machine Intelligence, 2003.



Pedro Lima

Phone: (+351) 218418274

E-mail: pedro.lima@tecnico.ulisboa.pt

Scholar ID: NUiEEYkAAAAJ

ORCID: 0000-0002-8962-8050

Author ID: 35550404900

Current position: Full Professor

Systems, Decision and Control

Research unit: ISR

Research interests:

I am generically interested in multi-robot systems, especially on bringing together Systems and Control and Artificial Intelligence concepts with the purpose of planning and executing multi-robot tasks under uncertainty in the actions effects and state observations. In particular, I am looking at discrete-event-based models of robotic tasks, and how to fine tune them using reinforcement learning algorithms (related to MDPs and POMDPs). One related subject is the cooperation between several static and mobile sensors (networked robot systems) to improve the perception of relevant objects and events, using sensor fusion techniques and Bayesian inference. Lately, I have become interested on the interaction among humans and robots in groups, and also on the use of machine learning and LLMs for planning under uncertainty.

Selected publications:

- Gabriel Costa, João Pinho, Miguel Ayala Botto, Pedro Lima "Online learning of MPC for autonomous racing", Robotics and Autonomous Systems, Vol 167, 104469, ISSN 0921-8890, 2023.
- Enrico Piazza, Pedro Lima, M. Matteucci "Performance Models in Robotics with a Use Case on SLAM", IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 4646-4653, 2022
- Meysam Basiri, Joao Goncalves, José Rosa, Rui Bettencourt, Alberto Vale, Pedro Lima "A multipurpose mobile manipulator for autonomous firefighting and construction of outdoor structures", Field Robotics, 1, pp. 102–126, 2021.

Rita Cunha

Phone: (+351) 218418090

E-mail: rita@isr.tecnico.ulisboa.pt

Scholar ID: vARGfqkAAAAJ

ORCID: 0000-0002-8925-1273

Author ID: 55605472200

Current position: Assistant Professor

Research unit: ISR

Research interests:

Systems, Decision and Control

My research interests are focused on the general areas of dynamical systems and control systems theory and are aimed at addressing the challenges raised by the development of autonomous robotic systems. My current topics of interest include motion control of single and multi-vehicle systems involving interaction with the environment, vision based and LiDAR-based control of unmanned aerial vehicles, navigation and control based on partial sensor information, optimal control and model predictive control applied to the operation of multi-vehicle systems, hybrid control and geometric control applied to systems evolving on manifolds.

Selected publications:

- D. Cabecinhas, R. Cunha, and C. Silvestre, "A nonlinear quadrotor trajectory tracking controller with disturbance rejection," Control Engineering Practice, vol. 26, 2014.
- P. Serra, R. Cunha, T. Hamel, D. Cabecinhas, and C. Silvestre, "Landing of a quadrotor on a moving target using dynamic image-based visual servo control," IEEE Transactions on Robotics, vol. 32, no. 6, pp. 1524–1535, 2017.
- D. Cabecinhas, R. Cunha, and C. Silvestre, "A trajectory tracking control law for a quadrotor with slung load," Automatica, vol. 106, pp. 384–389, 2019.

Rodrigo Ventura

Phone: (+351) 218418195

E-mail: rodrigo.ventura@isr.tecnico.ulisboa.pt

Scholar ID: sftSuj8AAAAJ

ORCID: 0000-0002-5655-9562

Author ID: 7102796668

Current position: Assistant Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

My research interests include the intersection between Robotics and Artificial Intelligence, with particular interest in human-robot interaction, mobile manipulation, biologically inspired cognitive architectures, and machine learning. This research is driven by applications in space robotics, urban search and rescue robotics, aerial robots, and social service robots.

Selected publications:

- Keenan Albee, Monica Ekal, Brian Coltin, Rodrigo Ventura, Richard Linares, and David W. Miller. The rattle motion planning algorithm for robust online parametric model improvement with on-orbit validation. IEEE Robotics and Automation Letters, 7(4):10946–10953, 2022.

- Pedro Rocha Cachim, Joao Gomes, and Rodrigo Ventura. Autonomous orbit determination for satellite formations using relative sensing: Observability analysis and optimization. Acta Astronautica, 200:301–315, 2022.

- Rute Luz, Jose Corujeira, Laurent Grisoni, Frederic Giraud, Jose L. Silva, and Rodrigo Ventura. On the use of haptic tablets for UGV teleoperation in unstructured environments: System design and evaluation. IEEE Access, 7:2169– 3536, 2019.

- Henrique Martins, Ian Oakley, and Rodrigo Ventura. Design and evaluation of a head-mounted display for immersive 3-D teleoperation of field robots. Robotica, 33(10):2166–2185, 2014.

Sérgio Pequito

Phone:

E-mail: sergio.pequito@tecnico.ulisboa.pt

Scholar ID: yoLKYQgAAAAJ

ORCID: 0000-0002-5143-1543

Author ID:

Current position: Associate Professor

Research unit: ISR

Systems, Decision and Control

Research interests:

At the intersection of control theory and biomedical engineering, my research establishes foundational frameworks for complex dynamical systems while advancing their medical applications. I develop rigorous mathematical approaches for designing, analyzing, and optimizing large-scale dynamical systems.

Selected publications:

- Emily Reed, Sarthak Chatterjee, Guilherme Ramos, Paul Bogdan, and Sérgio Pequito. "Fractional cyber-neural systems—A brief survey." Annual Reviews in Control 54, 386-408, 2022.
- Sarthak Chatterjee, Orlando Romero, Arian Ashourvan, and Sérgio Pequito. "Fractional-order model predictive control as a framework for electrical neurostimulation in epilepsy." Journal of neural engineering 17, no. 6, 066017, 2020.
- Guilherme Ramos, A. Pedro Aguiar, and Sérgio Pequito. "An overview of structural systems theory." Automatica 140, 110229, 2020.


Scientific Area of
Telecommunications

António Branco Rodrigues

Phone: (+351) 218418484

E-mail: antonio.rodrigues@lx.it.pt

Scholar ID: hk1cPd8AAAAJ

ORCID: 0000-0003-2115-7245

Author ID: 3549590550

Current position: Associate Professor

Research unit: IT

Research interests:

Telecommunications

Wireless communications including modulation, coding, multiple access echniques, cellular mobile radio systems, digital radio transmission, diversity reception and equalization problems for mobile environments including satellite/mobile systems. Location and positioning systems and services. Sensor Networks. Wireless Networks (WiFi, WiMax, UWB, etc.). Digital transmission, TV and multimedia evolution, digital relay links and optical communication systems. Cognitive radio systems and flexible spectrum usage.

Selected publications:

- F. Rodrigues, I. Sousa, M. P. Queluz, A. Rodrigues, "QoE-aware scheduling algorithm for adaptive HTTP video delivery in wireless networks", Wireless Communications and Mobile Computing, Hindawi, Vol. 2018, 2018.
- R. Bandeira, I. Sousa, M. P. Queluz, A. Rodrigues, "Coexistence of DC and CSMA in SRD channel access and resilience to LTE interference", Transactions on Emerging Teleccomunications Technologies, 29:e3301, 2018.
- F. Rosário, F. Monteiro, A. Rodrigues, "Fast matrix inversion updates for massive MIMO detection and precoding", IEEE Signal Processing Letters , Vol. 23, Nº 1, pp. 75 – 79, 2016.
- F. Rodrigues, J. Ascenso, A. Rodrigues, M. P. Queluz, "Blind quality assessment of 3D synthesized views based on hybrid feature fusion", IEEE Transactions on Multimedia, Vol. 21, Nº 7, pp. 1737-1749, 2019.

António Topa

Phone: (+351) 218418479

E-mail: antonio.topa@lx.it.pt

Scholar ID: a2-PcaoAAAAJ

ORCID: 0000-0003-1364-2494

Author ID: 6602094468

Current position: Assistant Professor

Research unit: IT

Telecommunications

Research interests:

Research interests are in the area of the characterization of the electromagnetic wave propagation and radiation in three-dimensional planar or circular waveguides involving complex media and metamaterials with negative refractive index (NRI): (1) The work on complex media has been mainly focused in the analysis of waveguides filled with chiral and omega media, finding application in the optical and millimetre-wave regimes. Both radiation and leaky modes have been investigated to suggest future application to new devices. (2) The work developed in metamaterials has been essentially devoted to the analysis of Double Negative Nonradiative Dielectric Waveguides (DNG-NRD) and DNG/DPS (Double Positive Media) directional couplers operating as contra-directional coupling devices. Anomalous refraction and backward waves suggest promising applications in the design of new waveguide components.

Selected publications:

- A. Topa, "Dispersion and Losses in Metamaterial DNG H-guides", Metamaterials and Plasmonics: Fundamentals, Modelling and Applications, Springer, 2009.
- A. Topa, "Electromagnetic Wave Propagation in Omega Waveguides:Discrete Complex Modes and Application to a Ridge Waveguide", Progress in Electromagnetic Research, EMW Publishing, 2004.
- A. Topa, "Guidance and Leakage Behavior of Uniaxial Ridge Waveguides", Journal of Electromagnetic Waves and Applications, Vol. 23, No. 13, 2009.

Ayman Radwan

Phone: (+351) 218 418 454

E-mail: ayman.radwan@tecnico.ulisboa.pt
aradwan@av.it.pt

Scholar ID: 7pWkDTYAAAAJ

ORCID: 0000-0003-1935-6077

Author ID: 16240017400

Current position: Assistant Professor

Research unit: IT

Telecommunications

Research interests:

Main research field is Wireless and Mobile networks. Research interests include network architectures (current 5G and future networks), fog-cloud networking, radio resource management and energy efficiency. MAC and network layer in mobile networks. Smart networking and energy efficiency for IoT, including verticals: eHealth and Smart City.

Selected publications:

- H. R. Chi, C. K. Wu, N. Huang, K. F. Tsang, and A. Radwan, "A Survey of Network Automation for Industrial Internet-of-Things Towards Industry 5.0," IEEE Transactions on Industrial Informatics, vol. 19, no. 2, pp. 2065-2077, 2023.

- H. R. Chi, A. Radwan, C. Zhang, M. Taha, "Managing Energy-Experience Trade-Off with AI Towards 6G Vehicular Networks," IEEE Communications Standards Magazine, vol. 7, no. 3, pp. 24 - 31, 2023.

- F. Marzouk, J. P. Barraca, and A. Radwan, "On Energy Efficient Resource Allocation in Shared RANs: Survey and Qualitative Analysis," IEEE Comm. Surveys & Tutorials, vol. 22, no. 3, pp. 1515-1538, 2020.

- M. Rocha, A. C. Nepomuceno, H. R. Chi, A. Radwan, P. André, Nélia Alberto, P. Antunes, and M. F. Domingues, "Indoor Localization Using Fiber Bragg Grating-Based Accelerometers for Smart Healthcare," IEEE Transactions on Consumer Electronics, vol. 70, no. 1, pp. 68-77, 2024.

Carlos Cardoso Fernandes

Phone: (+351) 218418481

E-mail: carlos.fernandes@lx.it.pt

Scholar ID: Ypjn8V0AAAAJ

ORCID: 0000-0001-5332-842X

Author ID: 7103089977

Current position: Full Professor

Research unit: IT

Research interests:

Telecommunications

Research interests span the following main topics: Development of new mm-Wave and sub-6 GHz antenna concepts for 5G, 6G and beyond, especially regarding interoperability with satellites. Development of final methods and technologies for an application to conduct clinical trials in hospitals. This topic falls under United Nations Sustainable Development Goal 3 - Good Health and well Being; Development of methods and technologies for microwave radar-based detection of floating macroplastic litter in oceans, using scanning instruments in satellites. This work started in the framework of an ESA-funded project.

Selected publications:

- A. Fockert, M. Eleveld, J. M. Felício, T. Costa, M. Vala, P. M. Marques, N. Leonor, A. A. Moreira, J.R. Costa, R. F. S. Caldeirinha, S.A. Matos, C. A. Fernandes, N. Fonseca, M. Simpson, A. Marino, A. Perez-Portero, A. Gonga, O. Burggraaff, S. Garaba, S. Salama, Y. Xiao, R. Calvert, T. Bremer, P. Maagt, Assessing the detection of floating plastic litter with advanced remote sensing technologies in a hydrodynamic test facility, Scientific Reports, Vol. 14, No. 1, 2024.

- J. M. Felício, J. Bioucas-Dias, J.R. Costa, C. A. Fernandes, Microwave Breast Imaging using a Dry Setup, IEEE Transactions on Computational Imaging, Vol. 6, No. 1, pp. 167 - 180, 2020.

- P. Naseri, S.A. Matos, J.R. Costa, C. A. Fernandes, N. Fonseca, Dual-Band Dual Linear to Circular Polarization Converter in Transmission Mode-Application to K/Ka-Band Satellite Communications, IEEE Transactions on Antennas and Propagation, Vol. 66, No. 12, pp. 7128 - 7137, 2018.

Carlos Reis Paiva

Phone: (+351) 218418479

E-mail: c.paiva@ieee.org

Scholar ID: BbFJ7UIAAAAJ

ORCID: 0000-0002-6184-232X

Author ID: 7006016436

Current position: Associate Professor

Research unit: IT

Telecommunications

Research interests:

My main current research interest is in the theoretical foundations of classical electrodynamics and its relation with special and general relativity. Namely, I want to use new mathematical tools in electromagnetic theory – such as differential forms and (Clifford) geometric algebra – in order to reach a new physical perspective on the relation between electromagnetic theory and relativity: to derive the two Maxwell equations (homogeneous and non-homogeneous, in spacetime) from two basic postulates (charge and magnetic flux conservation) in a metric-free setting so that they are applicable in special as well as in general relativity. My other current interests are: electromagnetic wave propagation in complex media (namely linear bianisotropic media and metamaterials such as double-negative media) and its applications in microwave engineering and photonics; nonlinear fiber optics, namely fiber solitons, and applications to fiber-optic communications systems; quantum physics and its applications in nanophotonics.

Selected publications:

- M. A. Ribeiro, C. R. Paiva, "Transformation and Moving Media: A Unified Approach Using Geometric Algebra," Chapter in Metamaterials and Plasmonics: Fundamentals, Modelling, Applications, edited by S. Zouhdi, A. Sihvola, A. P. Vinogradov, Springer, pp. 63-74, 2009.

- S. A. Matos, M. A. Ribeiro, C. R. Paiva, "Anisotropy without tensors: a novel approach using geometric algebra," Optics Express, Vol. 15, No. 23, pp. 15175-15186, 2007.

- C. R. Paiva, M.A. Ribeiro, "Doppler shift from a composition of boosts with Thomas rotation: a spacetime algebra approach," Journal of Electromagnetic Waves and Applications, Vol. 20, No. 7, pp. 941-953, 2006.

Fernando Pereira

Phone: (+351) 218418460

E-mail: fp@lx.it.pt

Scholar ID: ivtyoBcAAAAJ

ORCID: 0000-0001-6100-947X

Author ID: 7201690397

Current position: Full Professor

Research unit: IT

Telecommunications

Research interests:

The research interests are related to the multiple ways visual information – notably emerging plenoptic modalities such as point clouds, meshes and light fields - may be processed in the context of advanced multimedia applications with focus on learning-based technologies. This processing chain ranges from analysis, segmentation, coding, rendering and description to searching, filtering, summarization and adaptation, notably in increasingly heterogeneous environments, devices and user preferences..

Selected publications:

- A. Seleem, A. Guarda, Nuno M. M. Rodrigues, F. Pereira, "Deep learning-based compressed domain multimedia for man and machine: a taxonomy and application to point cloud classification", IEEE Access, Vol. 11, No. -, pp. 128979 - 128997, 2023.

- A. Guarda, M. Ruivo, L. Coelho, A. Seleem, Nuno M. M. Rodrigues, F. Pereira, "Deep learning-based point cloud coding and super-resolution: a joint geometry and color approach", IEEE Transactions on Multimedia, Vol., No., pp. 1 - 13, 2023.

- A. F. R. Guarda, N. M. M. Rodrigues, F. Pereira, "Adaptive deep learning-based point cloud geometry coding", IEEE Journal of Selected Topics in Signal Processing, vol. 15, nº 2, pp. 415-430, 2021.

- A. Sepas-Moghaddam, A. Etemad, F. Pereira, P.L. Correia, "CapsField: light field-based face and expression recognition in the wild using capsule routing", IEEE Transactions on Image Processing, vol. 30, pp. 2627-2642, 2021.

Francisco Sena da Silva

Phone: (+351) 218418468

E-mail: sena@lx.it.pt

Scholar ID:

ORCID:

Author ID: 0000-0003-2809-1867

Current position: Assistant Professor

Research unit: IT

Research interests:

Telecommunications

Efficient Simulation. Large Deviations and Importance Sampling. Communication Theory and Pattern Recognition.

Selected publications:

- F. Silva, J. Leitão, "Importance Sampling Evaluation of Digital Phase Detectors with Carrier Phase Tracking. A Large Deviations Approach", IEEE Transactions on Signal Processing, Vol. 56, No. 12, 2008.
- F. Silva, J. Leitão, "Importance Sampling Evaluation of Digital Phase Detectors Based on Extended Kalman-Bucy Filters", IEEE International Conference on Acoustics, Speech and Signal Processing, Vol. 2001.
- F. Silva, J. Leitão, "Error Floor Assessment of Digital Phase Detectors with Carrier Phase Tracking. A Large Deviations Approach", International Symposium on Information Theory, 2001.

João Felício

Phone: (+351) 218418477

E-mail: joao.felicio@lx.it.pt

Scholar ID: yq2RsNMAAAAJ

ORCID: 0000-0003-3439-5947

Author ID: 57000185200

Current position: Assistant Professor

Research unit: IT

Telecommunications

Research interests:

Research interests include the following topics: Development small and wearable antennas for biomedical applications; Radar-based sensing using microwaves; Study of radiowave communication channel; Development of new millimeter-wave antennas based-on low-cost and low-profile solutions; Characterization of dielectrics at microwave and millimeter-waves (measurement of complex permittivity) Development of antennas for small-satellites.

Selected publications:

- J. M. Felício, T. Costa, M. Vala, N. Leonor, J.R. Costa, P. M. Marques, A. A. Moreira, R. F. S. Caldeirinha, S.A. Matos, C. A. Fernandes, N. Fonseca, P. Maagt, Feasibility of Radar-based Detection of Floating Macroplastics at Microwave Frequencies, IEEE Transactions on Antennas and Propagation, Vol. 72, No. 3, pp. 2766 - 2779, 2024.

- S.A. Matos, N. Fonseca, João C. Serra Serra, J. M. Felício, J.R. Costa, C. A. Fernandes, Generalized Risley Prism for Beam-Steering Transmit Arrays With Reduced Grating Lobes, IEEE Transactions on Antennas and Propagation, Vol. 71, No. 11, pp. 8420 - 8428, 2023.

- M. Vala, S. Faria, P. Coimbra, N. Leonor, J. M. Felício, C. A. Fernandes, C. Salema, R. F. S. Caldeirinha, Effects of Fire Plumes from Pine Needles on Small-scale Fading in Radiowave Propagation, IEEE Transactions on Antennas and Propagation, Vol. 71, No. 4, pp. 3473 - 3484, 2023.

João Pires

Phone: (+351) 218418191

E-mail: jpires@lx.it.pt

Scholar ID: lVGbA6kAAAAJ

ORCID: 0000-0001-5908-4868

Author ID: 23390578100

Current position: Assistant Professor

Research unit: IT

Research interests:

Telecommunications

The research interests are mainly focused on the area of optical networking and involves the study of algorithms for network optimization and planning and aspects related with the interaction between the logical and physical layers. The analysis and development of strategies for offering protection and restoration in the optical domain are also considered.

Selected publications:

- D. Moniz, J. Pedro, J. Pires, "Network design framework to optimally provision services using higher-symbol rate line interfaces," IEEE /OSA Journal of Optical Communications and Networking, 11 (2), A174-A185, 2019.
- A. Eira, J. Pedro, J. Pires, "Optimal multi-period provisioning of fixed and flex-rate modular line interfaces in DWDM networks," IEEE/OSA Journal of Optical Communications and Networking, 7 (4), 223-234, 2015.
- J. J. O. Pires, L. G. C. Cancela, "Estimating the performance of direct-detection DPSK in optical networking environments using eigenfunction expansion techniques," IEEE/OSA Journal of Lightwave Technology, 28 (13), 1994-2003, 2010.

José Cunha Sanguino

Phone: (+351) 218418468

E-mail: sanguino@lx.it.pt

Scholar ID: ZMLfJ6AAAAAJ

ORCID: 0000-0002-8244-5905

Author ID: 24469075900

Current position: Assistant Professor

Research unit: IT

Telecommunications

Research interests:

Range-based positioning and navigation. Satellite radionavigation systems (GPS, GLONASS, Galileo). Geolocation on cellular mobile radio systems. Applications for location-based services.

Selected publications:

- J. Sanguino, F. Tocha, A. J. Rodrigues, WAW Location-based Service Positioning, Wireless Personal Communications, Vol. 58, No. 3, 2011.
- J. Reis, J. Sanguino, A. J. Rodrigues, Baseline Influence on Single-Frequency GPS Precise Heading Estimation, Wireless Personal Communications, Vol. 64, No. 1, 2012.
- R. Pereira, J. Sanguino, GPS Ambiguity Filter Sensitivity to the Precision of the Prior Knowledge of the Baseline Length, 3rd IEEE International Workshop on Metrology for Aerospace, IEEE Aerospace & Electronic Systems Society, Florence, Italy, 2016.

Luís M. Correia

Phone: (+351) 213100434

E-mail: luis.m.correia@tecnico.ulisboa.pt

Scholar ID: a0tgRXcAAAAJ

ORCID: 0000-0002-7765-9896

Author ID: 55829558200

Current position: Full Professor

Telecommunications

Research unit: INESC INOV-Lab

Research interests:

Work focused in Wireless/Mobile communications in the areas of propagation, channel characterization, radio networks, traffic and services.

Selected publications:

- Manuel M. Ferreira, Filipe D. Cardoso, Sławomir J. Ambroziak, Mariella Särestöniemi, Kenan Turbic and Luis M. Correia, "Influence of User Mobility on System Loss and Depolarization in a BAN Indoor Scenario", IEEE Transactions on Antennas and Propagation, Vol. 72, No. 8, pp. 6 678-6 690, 2024.
- Rafael Asorey-Cacheda, Luis M. Correia, Concepcion Garcia-Pardo, Krzysztof Wojcik, Kenan Turbic and Pawel Kulakowski, "Bridging Nano- and Body Area Networks: A Full Architecture for Cardiovascular Health Applications", IEEE Internet of Things Journal, Vol. 10, No. 5, pp. 4 307-4 323, 2023.
- Manuel M. Ferreira, Filipe D. Cardoso, Sławomir J. Ambroziak and Luis M. Correia, "Bandwidth Dependence of the Propagation Channel in Circular Metallic BAN Environments", IEEE Access, Vol. 11, pp. 20 159-20 168, 2023.

Maria Paula Queluz

Phone: (+351) 218418463

E-mail: paula.queluz@lx.it.pt

Scholar ID: 71GIbaEAAAAJ

ORCID: 0000-0003-0266-4022

Author ID: 6602528040

Current position: Associate Professor

Research unit: IT

Telecommunications

Research interests:

Quality assessment of immersive media, namely identification and characterization of the different sources of distortion, from media capture to rendering, in immersive media applications (e.g., omnidirectional video and free view-point video); development of quality metrics aiming to quantify the perceived distortions and the resulting quality of experience (QoE).

Selected publications:

- F. Jabar, J. Ascenso and M.P. Queluz, “Globally and locally optimized Pannini projection for high FoV rendering of 360° images,” in Signal Processing: Image Communication, Volume 129, 2024.
- F. Jabar, J. Ascenso and M. P. Queluz, "Object-Based Geometric Distortion Metric for Viewport Rendering of 360° Images," in IEEE Access, vol. 10, pp. 13827-13843, 2022.
- Sousa, M. P. Queluz and A. Rodrigues, “A survey on QoE-oriented wireless resources scheduling”, Journal of Network and Computer Applications, Volume 158, 2020.
- F. Jabar, J. Ascenso and M. P. Queluz, "Objective Assessment of Perceived Geometric Distortions in Viewport Rendering of 360° Images," in IEEE Journal of Selected Topics in Signal Processing, vol. 14, no. 1, pp. 49-63, 2020.

Mário Figueiredo

Phone: (+351) 218418464

E-mail: mario.figueiredo@tecnico.ulisboa.pt

Scholar ID: S-pd0NwAAAAJ

ORCID: 0000-0002-0970-7745

Author ID: 34769730500

Current position: Full Professor

Research unit: IT

Research interests:

Telecommunications

Machine learning, image analysis and processing, information theory, causal inference, optimization, explainable machine learning, fair machine learning.

Selected publications:

- G. Faria, A. Martins, M. Figueiredo, "Differentiable causal discovery under latent interventions", First Conference on Causal Learning and Reasoning, 2022.
- F. Andrade, M. Figueiredo, J. Xavier, "Distributed Banach-Picard iterations for locally contractive maps", IEEE Transactions on Automatic Control, 2022.
- A. Teodoro, J. Bioucas-Dias, M. Figueiredo, "A convergent image fusion algorithm using scene-adapted Gaussian-mixture-based denoising", IEEE Transactions on Image Processing, 2019.

Mário Silveirinha

Phone: (+351) 218418376

E-mail: mario.silveirinha@tecnico.ulisboa.pt

Scholar ID: TxPi744AAAAJ

ORCID: 0000-0002-3730-1689

Author ID: 6701603458

Current position: Full Professor

Research unit: IT

Research interests:

Telecommunications

Plasmonics and nano-photonics. Electromagnetic metamaterials. Quantum optics and fluctuation electrodynamics. Topological materials. Non-Hermitian and nonreciprocal effects in optics. Time and space-time crystals.

Selected publications:

- F. R. Prudêncio, M. G. Silveirinha, "Ill-defined topologies in local dispersive photonic systems", Phys. Rev. Lett., 129, 133903, 2022.
- S. Lannebère, D. E. Fernandes, T. A. Morgado, M. G. Silveirinha, "Nonreciprocal and non-Hermitian material response inspired by semiconductor transistors", Phys. Rev. Lett., 128, 013902, 2022.
- T. G. Rappoport, T. A. Morgado, S. Lannebère, M. G. Silveirinha, "Engineering transistor-like optical gain in two-dimensional materials with Berry curvature dipoles", Phys. Rev. Lett., 130, 076901, 2023.

Marko Beko

Phone:

E-mail: marko.beko@tecnico.ulisboa.pt

Scholar ID: _kW01-IAAAAJ

ORCID: 0000-0001-7315-8739

Author ID: 16067804800

Current position: Associate Professor

Research unit: IT

Telecommunications

Research interests:

Wireless communications and networking, signal processing, decision and estimation.

Selected publications:

- M. Beko, J. Xavier, V. Barroso, "Non-coherent Communication in MultipleAntenna Systems: Receiver design and Codebook construction", IEEE Transactions on Signal Processing, vol. 55, no. 12, pp. 5703 - 5715, 2007.
- M. Beko, "Efficient Beamforming in Cognitive Radio Multicast Transmission", IEEE Transactions on Wireless Communications, vol. 11, no. 11, pp. 4108-4117, 2012.
- S. Tomic, M. Beko, R. Dinis, "RSS-based Localization in Wireless Sensor Networks using Convex Relaxation", IEEE Transactions on Vehicular Technology, Regular Paper in Wireless Networks Section, vol. 64, no. 5, pp. 2037-2050, 2015.

Paulo Lobato Correia

Phone: (+351) 218418461

E-mail: paulo.lobato.correia@tecnico.ulisboa.pt

Scholar ID: oVdAR88AAAAJ

ORCID: 0000-0001-6525-9572

Author ID: 7006210685

Current position: Full Professor

Research unit: IT

Telecommunications

Research interests:

Research interests include image and video analysis and processing. Particular interest goes the usage of biometrical signals for recognition and other applications, as well as explainable biometrics.

Selected publications:

- M.S. Nixon, P.L. Correia, K.N. Nasrollahi, T.B.M. Moeslund, A.H. Hadid, M. Tistarelli, "On soft biometrics", Pattern Recognition Letters, Vol. 68, No. 2, pp. 218 - 230, 2015.
- A. Moghaddam, F. Pereira, P.L. Correia, Light Field based Face Presentation Attack Detection: Reviewing, Benchmarking and One Step Further, IEEE Transactions on Information Forensics and Security, Vol. 13, No. 7, pp. 1696 - 1709, 2018
- T. Verlekar, L. D. Soares, P.L. Correia, "Gait recognition in the wild using shadow silhouettes", Image and Vision Computing, Vol. 76, pp. 1 - 13, 2018.
- P. Albuquerque, P.L. Correia, T. Verlekar, L. D. Soares, "A Spatiotemporal Deep Learning Approach for Automatic Pathological Gait Classification", Sensors, Vol. 21, No. 18, pp. 6202 - 6202, 2021.

Paulo André

Phone: (+351) 218418486

E-mail: paulo.andre@lx.it.pt

Scholar ID: absctuEAAAAJ

ORCID: 0000-0002-6276-4976

Author ID: 35078108300

Current position: Full Professor

Research unit: IT

Research interests:

Telecommunications

My current research interests include the study and simulation of photonic devices and systems for applications in telecommunications, sensing, and energy, spanning both classical and quantum regimes.

Selected publications:

- S. Pratapsi, D. Cruz, P.S André, Native multi-qubit gates in transmon qubits via synchronous driving, Scientific Reports, Vol. 14, No. 1, 2024.
- G. Figueiredo, M.R. Ferreira, P.S André, Enhancing secret key distribution through advanced color modulation in visible light communication, Journal of Optical Communications and Networking, Vol. 16, No. 8, 2024.
- L. Dias, F C Ramalho, T. Silvério, M.R. Ferreira, L Fu, P.S André, Smart Optical Sensors for Internet of Things: Integration of Temperature Monitoring and Customized Security Physical Unclonable Functions, IEEE Access, Vol. 10, No. 2, pp. 24433 - 24443, 2022.
- F C Ramalho, S. correia, L Fu, L. Dias, P. Adão, P. Mateus, M.R. Ferreira, P.S André, Super modules-based active QR codes for smart trackability and IoT: a responsive-banknotes case study, Nature, Vol. 4, No. 1, 2020.