MAP Doctoral Program in Computer Science

MAP-I Unit

Advanced Artificial Intelligence

A. Program

1. Subject, justification and Motivation

Artificial Intelligence (AI), is concerned with the creation of intelligent machines. Artificial intelligence makes it possible for machines to be intelligent, learn from experience, adjust to new inputs and perform human-like tasks. The term artificial intelligence was coined in 1956, but AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage. While Hollywood movies and science fiction depict AI as human-like robots that take over the world, the evolution of AI technologies is very different, instead, AI has evolved to provide specific benefits and applications on most of the human's industries and applications. This course is concerned with the application of AI to concrete but complex problems that demand for advanced AI methodologies to be solved.

2. Objectives and Learning Outcomes

At the end of the Advanced AI course, students should be able to represent, acquire, manipulate and apply knowledge using computer systems to solve complex problems using Artificial Intelligence techniques. More specifically, the student should be able to:

- Understand the fundamentals of Artificial Intelligence and Intelligent Systems, what characterizes and distinguishes them, their applicability and where we find them in our daily lives.

- Understand the notion of Computational Agent and Multi-Agent System and be able to design and implement Agents and Multi-Agent Systems to solve different problems.

- Learn heuristic and systematic methods of Problem Solving, with and without Adversaries, using the Knowledge for solving complex problems.

- Learn methods of Representation and Reasoning with uncertain Knowledge using different formalisms.

- Understand the basics of Natural Language Processing using Classical and Statistical approaches.

- Know and be able to apply Machine Learning algorithms of different types (Unsupervised, Supervised, Reinforcement and Deep Learning) to solve complex problems.

- Understand advanced topics in Artificial Intelligence and be able to formulate a vision into the future of AI and its practical applications now and in the future.

A successful learner from this discipline will be able to acquire knowledge of current state and trends in artificial intelligence, demonstrate an understanding of main challenges of the discipline and be enabled to select appropriate techniques to solve them; have a broad critical understanding of how Artificial Intelligence may be applied generally solve complex problems; Reference the sources used in their work in the context of advanced AI, being aware of the best projects/research works in this area around the world. Students must use accurately the standard referencing styles within the text of all written work for all sources used.

3. Detailed Program

I. Introduction to Artificial Intelligence (AI)

Definition of AI. Fundamentals, Scope, Evolution and Chronology of AI. Problems and Approaches of AI and Intelligent Systems. AI Applications.

II. Intelligent Agents and Multi-Agent Systems

The Concept of Agent. Environments. Agent Architectures: Reactive, Deliberative, Goal-Based, Utility-Based, Learning and BDI. Multi-Agent Systems: Concept, Motivation, Architectures, Communication, Coordination. Practical Examples of Application.

III. Problem Solving Methods

Problem Formulation. State Space. Search Strategy. Uninformed Search: Breadth First, Depth First, Uniform Cost, Iterative Deepening, Bidirectional Research. Intelligent Search: Greedy Search, A* Algorithm. Search with Adversaries: Game Search, Minimax Algorithm, Alpha-Beta Cuts, Search with Imperfect Information. Practical Examples of Application.

IV. Optimization and Metaheuristics

Formulation of Decision/Optimization Problems. Hill-Climbing, Simulated Annealing, Tabu Search, "Ant Colony". Genetic Algorithms and Evolutionary Computation. Constraint Satisfaction. Practical Examples of Application.

V. Knowledge Engineering

Knowledge Representation and Reasoning. Propositional and Predicate Logic. Semantic Networks, Frames, Rules, and Ontologies. Logic Programming and Constraints. Reasoning with Uncertain Knowledge. Knowledge-Based Systems. Practical Examples of Application.

VI. Machine Learning

Types of Machine Learning. Unsupervised Learning. Supervised Learning. Decision Trees. Artificial Neural Networks. Support Vector Machines. Reinforcement Learning. Q-Learning, SARSA, SAC and PPO Algorithms. Deep Learning. Practical Application Examples.

VII. Natural Language Processing

Processing Levels. Syntactic and Semantic Analysis. Classical Approach. Definite Clauses Grammars. Statistical Approach. Text Mining. Machine Learning in NLP. Deep Learning in NLP. Practical Application Examples.

VIII. Advanced Topics in Artificial Intelligence

Perception/Vision, Interaction, Planning and Scheduling, AI for Games, Intelligent Robotics, Intelligent Simulation, Social Intelligence. Cloud AI. The Future of AI. IA and the Society. Beneficial IA. Explainable AI. Machine Ethics. Weak and Strong IA. Super Intelligence. The Singularity.

4. Teaching Methods and Evaluation System

Main teaching techniques will be focused on:

- Challenging students to higher level learning as is appropriate in a PhD program of this type. Of course low level learning, i.e., comprehending and remembering basic information and concepts is important. However emphasis of Advanced AI will be on problem solving, decision making, critical thinking/design, and creative thinking/design.

- Use active learning such as the use of AI platforms, frameworks, demonstrators and competitions. Exposition will be made mostly with interaction in theoretical classes. Some learning will of course be passive, i.e., listening and reading. However, high level learning requires active learning and thus the use of appropriate interactive material, platforms, simulators and systems.

- Structured sequence of different learning activities (lectures, demonstrations, reading, analysis, writing, oral presentations, design, experimentation, among others). Learning activities structured in a sequence such that they enable opening classes and assignments about basic principles to lay the foundation for complex and high level learning tasks in later, complex classes and assignments.

- Detailed feedback given to students about the quality of their research work and learning process. High level, active learning require, more than any type of learning, frequent and immediate feedback for students to know whether they are "doing it correctly!".

This high-level teaching method will enable student not only to increase their skills in researching about advanced artificial intelligence but also in all other areas related to informatics and computer science. Some of the exercises will be supported by documentation that will be produced specifically for this course.

This is a research discipline, intended first to teach the students the state of the art in advanced artificial intelligence, and then to help them to do a simple project and a paper of publishable quality in an international conference about this subject. There will be a significant amount of reading/analysis of quality research papers that will be handed out.

The evaluation of students will be based on practical work throughout the course, without exam:

- Analysis of a selected scientific paper about an Advanced AI subject;

- Oral presentation of a selected new trend on Advanced AI;

- Practical Project with demonstration, oral defence and production of a publishable scientific paper.

5. Bibliography

- Russell, Stuart & Norvig, Peter (2020), Artificial Intelligence: A Modern Approach, 4th Edition, Pearson Education Limited, ISBN: 978-9-332-54351-5.

- Poole. David L. & Mackworth, Alan K.,(2017), Artificial Intelligence: Foundations of Computational Agents, 2nd Edition, Cambridge University Press, Available at: http://artint.info/2e/html/ArtInt2e.html

- Weiss, Gerhard (editor) (2013), Multiagent Systems, Second Edition, The MIT Press, Intelligent Robotics and Autonomous Agents series, Cambridge, Massachusetts, London England, ISBN: 978-0-262-01889-0

- Domingos; Pedro (2015), The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World, Basic Books, ISBN: 978-0465065707

- Costa, Ernesto & Simões, Anabela (2008), *Inteligência Artificial: Fundamentos e Aplicações, Second Edition*, FCA, ISBN: 978-9-727-22340-4S

B. Teaching Staff

1. Summary

Teaching staff is based on some of the most active researcher on Artificial Intelligence research in the MAP space in Portugal. All teachers are part of APPIA –Portuguese association for Artificial Intelligence current directive board (and are exactly the four members of the MAP space on that board), with emphasis for three members of the direction including APPIA president (Paulo Novais) and one of the vice-presidents (Luis Paulo Reis). The teaching staff has extensive research work on most of the Artificial Intelligence areas with a very large number of papers published and projects coordinated/developed.

2. Coordinator

Luis Paulo Reis – University of Porto – FEUP/LIACC

- Associate Professor at FEUP – Faculty of Engineering of the University of Porto
- Director of LIACC – Artificial Intelligence and Computer Science Lab., University of Porto
- President of APPIA – Portuguese Association for Artificial Intelligence

3. Short CVs

Luís Paulo Reis

Name: Luís Paulo Gonçalves dos Reis

Place and Date of Birth: Cedofeita, Porto, October**,** 15th of 1970

Address: University of Porto, Faculty of Engineering, Rua Dr. Roberto Frias s/n 4200 465 Porto

Phone: +351919455251   **E-Mail:** lpreis@fe.up.pt

Short CV:

Luis Paulo Reis is an Associate Professor at the University of Porto in Portugal and Director of LIACC – Artificial Intelligence and Computer Science Laboratory where he also coordinates the Human-Machine Intelligent Cooperation Research Group. He is an IEEE Senior Member and he was president of the Portuguese Society for Robotics, is vice-president of the Portuguese Association for Artificial Intelligence and was director of MIEGSI. During the last 25 years he has lectured courses, at the University, on Artificial Intelligence, Intelligent Robotics, Multi-Agent Systems, Simulation and Modelling, Games and Interaction, Educational/Serious Games and Computer Programming. He was principal investigator of more than 10 research projects in those areas. He won more than 50 scientific awards including wining more than 15 RoboCup international competitions and best papers at conferences such as ICEIS, Robotica, IEEE ICARSC and ICAART. He supervised 21 PhD and 102 MSc theses to completion and is supervising 8 PhD theses. He organized more than 50 international scientific events and belonged to the Program Committee of more than 300 scientific events. He is the author of more than 350 publications in international conferences and journals (indexed at SCOPUS or ISI Web of Knowledge).

Academic Degrees:

- Phd, Sep 2003, Eng. Electrotécnica e de Computadores, FEUP, Artificial Intelligence (MAS)
- MSc, Dec 1995, Eng. Electrotécnica e de Computadores, FEUP, Industrial Informatics (Very Good), 18.3 Val (out of 20)

- Licenciatura (5 Year BSc), Jul 1993, Eng. Electrotécnica e de Computadores, FEUP, Informatics and Systems, 18 Val (out of 20)

Present Position:

- Associate Professor/Professor Associado (since Mar 2018) at University of Porto/Faculty of Engineering),
- Director (since May 2016) of LIACC – Artificial Intelligence and Computer Science Lab. from UPorto
- President of APPIA – Portuguese Association for Artificial Intelligence
- Researcher (since Dec 1995) and Member of the Directive Board (since Oct 2007) of LIACC
- Collaborator (since 2011/12) of Centro ALGORITMI, INESC-TEC and IEETA

Past Positions:

- Associate Professor/Professor Associado at University of Minho, Sep 2011 – Mar 2018
- Assistant Professor/Professor Auxiliar at FEUP/DEI, Oct 2003– Set 2011
- Assistente Convidado at FEUP, Sep 2001 – Oct 2003
- Mestre Assistente at Univ. Fernando Pessoa – Porto, Oct 1996 – Sep 2001
- Researcher at INEB – Instituto de Eng. Biomédica, Sep 1994 – Oct 1995
- Monitor at FEUP, Oct 1991 – Nov 1993

Pedagogical and Divulgation Activities:

- More than 40 courses created, including for MSc level: Logic Programming, Artificial Intelligence, Intelligent Systems, Robotics, Intelligent Robotics, Intelligent Agents, Planning and Scheduling, Algorithm and Data Structures, Programming, Simulation, Thesis Preparation, Dissertation, and for PhD Programs: Intelligent Robotics (MAP-I), Planning and Scheduling (PRODEI-FEUP), Robotics (PRODEI-FEUP), Advanced Methodologies for Simulation and Modeling (PRODEI-FEUP/MAP-I).
- Participation in more than 50 divulgation actions at FEUP and UMinho (including Feira de Ciência e Tecnologia, Mostras de Ciência, Ensino e Inovação da UP, Exposição Ciência e Robótica – Arrábida Shopping, Semanas Abertas da FEUP and Talks in Superior/Secondary Schools).

PhD/Postdoctoral/MSc Supervising:

- 21 PhD Thesis supervised concluded and 8 PhD Thesis ongoing.
- 6 Postdoctoral researchers supervised.
- 130 MSc Thesis supervised concluded and 12 MSc Thesis ongoing.

Research Interests:

- Artificial Intelligence (Multi-Agent Systems, Intelligent Agents, Coordination in Multi-Agent Systems, Simulation, Intelligent Robotics, Robotic Soccer, Constraint Logic Programming).

Five Selected Research Projects:

- *ABSES - Agent Based Simulation of Ecological Systems* (FCT/POSC/EIA/57671/2004, 75000 EUR, Apr 2005 – Oct 2007, Principal Researcher)
- *ACORD - Adaptative Coordination of Robotic Teams* (FCT/PTDC/EIA/70695/2006, 95000 EUR, Jan 2008 – Dec 2009, Principal Researcher)
- *Intellwheels - INTELLWHEELS - Intelligent Wheelchair with Flexible Multimodal Interface* (FCT/PTDC/EEA-CRO/98664/2008, 94500 EUR, Principal Researcher),
- *QVida+ /QLife+: Continuos Quality of Life Estimation for effective Clinical Decision Support,* Portugal 2020, Principal Researcher UMinho, Funding 680k Eur, 2016-2019
- *IA.SAE – Inteligência Artificial na Segurança Alimentar e Económica (FEUP/ASAE), Funding 125k Eur–* Principal Researcher*, 2018-2020*

Publications and Communications:

- *More than 350 Papers published indexed at SCOPUS/ISI WoK.*

- *Publications: 2 Thesis, 30 editions of Conference Proceedings, 50 Papers in International Journals, 200 Book Chapters/Series (Springer/IEEE), 10 Papers in National Journals, 150 Papers in other International indexed Conferences,*
- *40 Invited Talks including, among others: ICAART2012, LARS/SBR2012, ICINCO2013. WAF 2014, ICSports2014, BRASERO2015, SIROCO2015, CLAWAR 2017.*

Program/Scientific Committee in Conferences:

- President of the Portuguese Society for Robotics (2013-2015), President of the General Assembly of the Iberian Association for Information Systems and Technology (2011-...), Vice-President of SPR (2015-2017), Vice-President of APPIA – Portuguese Association for Artificial Intelligence (2016-…).

- Main Conference/Workshop Organization: MASTA2001(Porto), Festival Nacional de Robótica (Porto, 2004), Scient. meeting FNR2004 (Porto, 2004), IROBOT2005 (Covilhã, 2005), MASTA2005 (Covilhã, 2005), CeNPLf2006 (Porto, 2006), Euro RoboCup2006 (Eindhoven, 2006), IROBOT2007 (Guimarães, 2007), MASTA2007 (Guimarães, 2007), IROBOT2008 (Lisbon, 2008), CISTI2009 (P.Varzim, 2009), CISTI2010 (Santiago Compostela, 2010), CISTI2011 (Chaves, 2011), IROBOT2011 (Lisbon, 2011), AI4Games2011 (Lisbon, 2011), ICAART2012 Sp.Session Int. Robotics (Vilamoura, 2012), Robotica2012 (Guimarães, 2012), EuroRoboCup2012 (Eindhoven, 2012), RoboCup2012 Sim32(Cid. Mexico, 2012), CISTI2012 (Madrid, 2012, IEEE ICARSC2013 (Lisbon, 2013), CISTI2013 (Lisbon, 2013), EPIA2013 (Azores, 2013), ICINCO2013 Doct.Cons (Reykjavic, 2013), ROBOT2013(Madrid, 2013), CISTI2014 (Barcelona, 2014), IBERAMIA2014 Robotics (Sant. Chile, 2014), RoboCup 2014 Sim3D (J.Pessoa, Brazil, 2014), CIAIQ2014(Badajoz, 2014), CISTI2015 (Aveiro), WorldCIST2015 (Azores), CIAIQ2015 (Aracaju), IROBOT@EPIA2015 (Coimbra), ROBOT2015 (Lisbon), WorldCIST2016 (Recife, Brazil), CISTI2015 (Gran Canária, Spain), CIAIQ2016 (Porto), ISQR2016 (Porto), WorldCIST2017 (Porto Santo, Madeira), CISTI 2017 (Lisbon), CIAIQ 2017 (Salamanca, Spain), ISQR 2017 (Salamanca, Spain), IROBOT@EPIA2017 (Porto), EPCGI 2017 (Guimarães), RAR@ROBOT2017 (Seville, Spain), SimRob@ROBOT2017 (Seville, Spain), WorldCIST2018 (Naples, Italy), Sim3D@RoboCup2018 (Montreal, Canada), IEEE ICARSC 2019 (Porto/Gondomar), Robotica2019 (Porto/Gondomar), WorldCIST2019 (Tenerife, Spain), ROBOT 2019 (Porto), EPIA2019 (Vila Real)

- Main Program Commitees: RoboCup TC (2001-2003), Bal.Rea.Soc.Del.MAS01 (LNAI vol.2103), WAF01 (Madrid, Sp), MASTA01 (Porto, PT), CeNPLf (04-07), Robotica (04-09, Porto, Coimbra, Guim., Algarve, Aveiro, C.Branco), RoboCup04 Int. Symp. (Lisbon, PT), Tékhne – Rev.Est.Polit. (2004-...), AAMAS05 (Utrecht, Ne), MASTA05 (Covilhã, PT), IROBOT05 (Covilhã, PT), RoboCup06 Int. Symp. (Bremen, Ge), CISTI06-09 (PT, ES), IBERAMIA/SBIA06 (Rib.Preto, Brazil), AAMAS06 (Hakodate, Jp), VIPImage07 (Porto, PT), AAMAS07 (Hawai, USA), ASM07 (P.Mal., Sp), RoboCup07 Int.Symp(Atlanta, USA), IROBOT07 (Guim., PT), MASTA07 (Guim., PT), RoboCup08 Int.Symp(Suzhou, Cn), IACe-T'2008 (Amman, Jordan), ISVC'2008 (Las Vegas, USA), AAMAS08 (Estoril, PT), IBERAMIA08 (Lisboa, PT), SBIA08 (Salvador, Br), ECAI08 (Patras, Gr), ICAART'2009 (Porto, PT), VIPImage09 (Porto, PT), IROBOT09 (Aveiro, PT), MASTA09 (Aveiro, PT), RoboCup09 Int.Symp (Graz, Austria), Robotica 09 (C.Branco, Portugal), AITUM09, CISTI09, WISA09, SDIA09, ASM09, DSIE09, IECON09, ISVC09, ICAART10, CISTI10, Robotica10, RoboCup'2010 Int.Symp, DSIE10, LARS/EnRI10, SOCO2010, AIS2010, AIS 2011, SOCO 2011, DSIE 2011, InECCE 2011, KDIR 2011, Robotica 2011, CISTI 2011, SGamePlay2011, WISA2011, RoboCup Symp. 2011, ASM 2011, ICAART 2011, AI4Games 2011, IROBOT 2011, AITS 2011, MASTA 2011, Robotica2012, IBERAMIA 2012, ICAART 2012, KDIR2012, AIS2012, VipImage2012, CISTI2012, SOCO2012, RoboCup Symp. 2012, SGamePlay2012, SS@EASSS12, EPIA2013, WorldCist2013, IROBOT2013, AI4Games2013, AITS2013, MASTA2013, KDIR2013, Robotica2013, CISTI2013, ICAART2013, AAMAS2013, IJCAI2013, RoboCup Symp. 2013, ROBOT2013, CLBIQ 2013, RoboCup 2013 PPP, IEEE ICARSC 2013 ,SGaMePlay 2013, SOCO 2013, SS@EASSS13 , WISA 2013, EPCG2013, DSIE 2013, IEEE ICARSC 2014, ICAART2014, CIAIQ 2014, CISTI 2014, CONTROLO 2014, EPCG 2014, FEIM-2014, IBERAMIA 2014, ICIIE 2014, MASH'14, RoboCup Symp2014, IEEE ICARSC 2014, SOCO 2014, icSports 2015, ICAART2015, KDIR2015, RoboCup Symp2015, IEEE ICARSC 2015, EPIA 2015, Brasero 2015, SBR-LARS 2015, A2HC 2015, SOCO 2015, CIAIQ 2015, CISTI 2015, ROBOT2015, WorldCIST 2015, SI-HAIS-SOCO-CISIS-2015, EPCGI2016, CIAIQ2016, ISQR2016, IEEE ICARSC 2016, SOCO 2016, ICAART2016, CompImage2016, RoboCup Symp2016, Controlo 2016, Iberamia 2016, SBR-LARS 2016, PECS 2016, KDIR2016, ICAART2017, WorldCist 2017, PAAMS2017, AAAT@PAAMS2017, WISA@CISTI 2017, ASDACS@CISTI 2017, CISTI 2017 Doctoral Symp, FiCloud 2017, SDIA@EPIA 2017, IROBOT2017, ECMR2017, EPCGI2017, WS02-AAAT2017, RoboCup Symp2017, IWAISe@IJCAI2017, KDIR2017, CIAIQ 2017, ISQR 2017, SOCO 2017, IEEE ICARSC2017, ROBOT'2017 – General Track/ML in Rob/WAF/Rob.Sol.forFM, Rob.CSforInd4.0, Manufacturing2017, SBR-LARS 2017, ICAART2018, GRAPP2018, PAAMS 2018, SBR-LARS 2018.

Ten Selected Publications:

- Daniel Castro Silva, Pedro Henriques Abreu, Luís Paulo Reis, Eugénio Oliveira, Development of a Flexible Language for Mission Description for Multi-Robot Missions, Information Sciences, vol. 288, pp. 27-44, 2014 (SCImago: Q1, ISI-JCR IF:4.83)
- Abbas Abdolmaleki, R. Lioutikov, Jan Peters, Nuno Lau, Luis Paulo Reis, Gerhard Neumann, Model-Based Relative Entropy Stochastic Search, Advances in Neural Information Processing Systems, 29th Annual Conference on Neural Information Processing Systems, pp. 3537-3545, NIPS 2015, NIPS Foundation Inc., MIT Press, Montreal, Quebec, Canada, December 7-12, 2015, (CORE A*/A*, SCOPUS)
- Brígida Mónica Faria, Luís Paulo Reis, Nuno Lau, A Methodology for creating an Adapted Command Language for Driving an Intelligent Wheelchair, Special Issue on Autonomous Robot Systems, (2015) Journal of Intelligent and Robotic Systems: Theory and Applications, Springer, Vol. 80, Issue:2, pp.609-623, 2015 (SCImago: Q1, ISI-JCR IF:1.51)
- Abbas Abdolmaleki, Nuno Lau, Luis Paulo Reis, Gerhard Neumann, Non-Parametric Contextual Stochastic Search, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Daejeon, South Korea, October 9-14, pp. 2643-2648, 2016, DOI: 10.1109/IROS.2016.7759411. (IEEE, CORE A/A, SCOPUS)
- Abbas Abdolmaleki, Bob Price, Nuno Lau, Luis Paulo Reis, Gerhard Neumann, Contextual Covariance Matrix Adaptation Evolutionary Strategies, Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence, IJCAI 2017, Melbourne, Australia, ijcai.org 2017, ISBN 978-0-9992411-0-3, August 19-25, pp. 1378-1385, 2017 (CORE A*/A*, SCOPUS)
- Abbas Abdolmaleki, Bob Price, Nuno Lau, Luis Paulo Reis, Gerhard Neumann, Deriving and Improving CMA-ES with Information Geometric Trust Regions, Proceedings of the 2017 Genetic and Evolutionary Computation Conference, GECCO 2017, July 15-19, Association for Computing Machinery, Inc, pp. 657-664, DOI:10.1145/3071178.3071252, 2017 (ACM, CORE A/A, SCOPUS)
- Paula Rego, Rui Rocha, B.M. Faria, Luís Paulo Reis, Pedro Moreira, A Serious Games Platform for Cognitive Rehabilitation with Preliminary Evaluation, (2017) Journal of Medical Systems, Vol. 41 (1), art. 10, (SCImago: Q2, ISI-JCR IF: 2.46)
- Brígida Mónica Faria, José Diogo Ribeiro, A. Paulo Moreira, Luis Paulo Reis, Boccia Game Simulator: Serious Game Adapted for People with Disabilities, Expert Systems, Wiley, June 2018 https://doi.org/10.1111/exsy.12299 (2018, in press) (SCImago: Q2, ISI-JCR IF=1.43)
- David Simões, Nuno Lau, Luis Paulo Reis, Guided Deep Reinforcement Learning in the GeoFriends2 Environment, IJCNN - International Joint Conference on Neural Networks, Paper ID: 18337, Rio de Janeiro, Brazil, July 8-13, 2018 (IEEE, CORE A/A, SCOPUS)
- César Ferreira, T. Cunha, Luís Paulo Reis, Cristina Santos, Torque Controlled Biped Model through a Bio-Inspired Controller Using Adaptive Learning, IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2018, Madrid, Spain, October 1-5, 2018 (IEEE, CORE A/A, SCOPUS)
- Amanda Sizo, A. Lino, Luis Paulo Reis e Álvaro Rocha, An Overview of Assessing the Quality of Peer Review Reports of Scientific Articles, International Journal of Information Management, Elsevier Ltd, UK, ISSN 02684012, (2018, in press) (SCImago: Q1, ISI-JCR IF=4.52)

Paulo Novais

Name: Paulo Jorge Freitas de Oliveira Novais

Place and Date of Birth: Guimarães, November 13th of 1967

Address: Universidade do Minho, Departamento de Informática, Campus de Gualtar, 4710 - 057 Braga - Portugal

Phone: +351932814062   **E-Mail:** pjon@di.uminho.pt

Short CV:

Paulo Novais is a Full Professor of Computer Science at the Department of Informatics, in the School of Engineering of the University of Minho (Portugal) and a researcher at the ALGORITMI Centre in which he is the Leader of the research group ISlab - Synthetic Intelligence lab, and the coordinator of the research line Computer Science and Technology (CST). He is the director of the PhD Program in Informatics and co-founder and Deputy Director of the Master in Law and Informatics at the University of Minho. His main research aim is to make systems a little more smart, intelligent and also reliable. He has led and participated in several research projects sponsored by Portuguese and European public and private Institutions. He had supervised several PhD and MSc students. He is the co-author of over 350 book chapters, journal papers, conference and workshop papers and books. He is the president of APPIA (the Portuguese Association for Artificial Intelligence) since 2016; Senior member of the IEEE (Institute of Electrical and Electronics Engineers); Member of the IFIP (International Federation for Information Processing) - TC 12 Artificial Intelligence. Member of the executive committee of the IBERAMIA (IberoAmerican Society of Artificial Intelligence). He has served as an expert of several institutions such as EU Commission and FCT (Portuguese agency that supports science, technology and innovation).

Academic degrees

·   Habilitation in Computer Science (Agregação ramo de conhecimento em Informática) at the University of Minho, School of Engineering, 2011.
·   PhD in Computer Science at the University of Minho, School of Engineering, 2003.
·   Msc in Computer Science at the University of Minho, School of Engineering, 1996.
·   Graduation in Systems and Informatics Engineering, University of Minho, School of Engineering, Department of Informatics, 1992.

Present positions

·   Full Professor (Professor Catedrático), at the University of Minho.
·   Member of the Working Group on Artificial Intelligence Applications - WG12.5, da IFIP - International Federation for Information Processing, Technical Committee TC 12 – Artificial Intelligence, since 2016.
·   Member of the Executive board of the IBERAMIA – IberoAmerican Society of Artificial Intelligence, since 2014.
·   Coordinator of the Scientific Committee of the Gulbenkian Grant Program "New Talent in Artificial Intelligence", Calouste Gulbenkian Foundation, since 2017.

PhD/Postdoctoral/MSc Supervising:

·   14 PhD Thesis supervised concluded and 11 PhD Thesis ongoing.
·   11 Postdoctoral researchers supervised.
·   88 MSc Thesis supervised concluded and 10 MSc Thesis ongoing

Research Interests:

·   Intelligent Systems/Artificial Intelligence: Knowledge Representation and Reasoning, Agent and Multi-Agent Systems, Ambient Intelligence, Conflict Resolution.

Five Selected Research Projects:

·   CAMCoF - Context-aware Multimodal Communication Framework, Starting date: 06.2013; duration: 2 years,Funding agency: Portuguese FCT; PTDC/EEI-SII/1386/2012, Budget: €140.762,00, Principal Investigator

- TIARAC – Telemática e Inteligência Artificial na Resolução Alternativa de Conflito, Starting date: 09.2018; duration: 2 years, Funding agency: Portuguese FCT; PTDC/JUR/71354/2006, Budget: €124.342,00, Principal Investigator
- Agentes Inteligentes e Relações Jurídicas, Starting date: 03.2016; duration: 3 years, Funding agency: Portuguese FCT; POCI/JUR/57221/2004, Budget: €25.000,00, Principal Investigator
- Deus ex Machina - Symbiotic technology for societal efficiency gains: Deus ex Machina (DEM), NORTE 2020, Funding agency: NORTE-01-0145-FEDER-000026, Starting date: 02/01/2016-31/12/2018, Budget: €2.600.513,40, Researcher
- RISEWISE – Rise Women with disabilities in Social Engagement, Funding agency: MSCA-RISE-2015 - Marie Skłodowska-Curie Research and Innovation Staff Exchange, (RISE), Nº 690874, Starting date: 01/09/2016 – 48 months, Principal Investigator (UMinho partner), Budget: € 139.500,00

Publications and Communications:
- Total number of Publications:
  - Books: 26
  - Chapters in Books with peer review: 21
  - Papers in Journals with peer review: 95
  - Publications in International Conferences with peer review:
  - Book Chapter Springer: 145
  - Proceedings of International Conferences: 97
- 60 Invited Talks including, among others: EVIA 2016, IC3K 2017, IJCCI 2017, The SmartConnected.World 2017, ICEC 2017.

Program/Scientific Committee in Conferences:
- President of APPIA – Portuguese Association for Artificial Intelligence (2016-2019).
- Member of the Working Group on Artificial Intelligence Applications - WG12.5, da IFIP - International Federation for Information Processing, Technical Committee TC 12 – Artificial Intelligence, since 2016.
- Member of the Executive board of the IBERAMIA – IberoAmerican Society of Artificial Intelligence, since 2014.
- Coordinator of the Scientific Committee of the Gulbenkian Grant Program "New Talent in Artificial Intelligence", Calouste Gulbenkian Foundation, since 2017.
- Steering Committee of the IE - The International Conference on Intelligent Environments.
- Steering Committee of the EPIA – the Portuguese Conference on Artificial Intelligence.
- Steering Committee of the ISAmI - International Symposium on Ambient Intelligence.
- Steering Committee IDC - International Symposium on Intelligent Distributed Computing.
- International Advisory Committee of the HAIS - International Conference on Hybrid Artificial Intelligence Systems.
- International Advisory Committee of the SOCO - International Conference on Soft Computing Models in Industrial and Environmental Applications.
- Steering Committee of the PRO-VE – IFIP Working Conference on Virtual Enterprises. 2008-2015. Participation in the organization, either as a Program Chair or as Organizer, of several (58) national and international scientific meetings, of which the following events are worthy of note: International Symposium on Ambient Intelligence, International Conference on Pervasive Computing Technologies for Healthcare, International Conference on Intelligent Environments, International Workshop on Soft Computing Models in Industrial Applications, European Conference on Artificial Intelligence, European Simulation and Modeling Conference and various Summer School.

Ten Selected Recent Publications:

Rincon, J.A., Costa, A., Carrascosa, C., Novais, P., Julian, V., EMERALD-Exercise Monitoring Emotional Assistant, (2019) Sensors (Basel, Switzerland), 19 (8), . DOI: 10.3390/s19081953

Carneiro, J., Saraiva, P., Conceição, L., Santos, R., Marreiros, G., Novais, P., Predicting satisfaction: Perceived decision quality by decision-makers in Web-based group decision support systems, (2019) Neurocomputing, 338, pp. 399-417. , DOI: 10.1016/j.neucom.2018.05.126

Canizes, B., Soares, J., Costa, A., Pinto, T., Lezama, F., Novais, P., Vale, Z., Electric vehicles' user charging behaviour simulator for a smart city, (2019) Energies, 12 (8), art. no. 1470, , DOI: 10.3390/en12081470,

Carneiro, D., Novais, P., Augusto, J.C., Payne, N., New methods for stress assessment and monitoring at the workplace, (2019) IEEE Transactions on Affective Computing, 10 (2), art. no. 7914724, pp. 237-254. , DOI: 10.1109/TAFFC.2017.2699633

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Costa, A., Rincon, J.A., Carrascosa, C., Julian, V., Novais, P. Emotions detection on an ambient intelligent system using wearable devices, (2019) Future Generation Computer Systems, 92, pp. 479-489. Cited 2 times., DOI: 10.1016/j.future.2018.03.038

Carneiro, D., Novais, P., Durães, D., Pego, J.M., Sousa, N., Predicting completion time in high-stakes exams, (2019) Future Generation Computer Systems, 92, pp. 549-559. DOI: 10.1016/j.future.2018.01.061

Casado-Vara, R., Novais, P., Gil, A.B., Prieto, J., Corchado, J.M., Distributed Continuous-Time Fault Estimation Control for Multiple Devices in IoT Networks, (2019) IEEE Access, 7, art. no. 8613014, pp. 11972-11984. DOI: 10.1109/ACCESS.2019.2892905

Oliveira, T., Silva, A., Satoh, K., Julian, V., Leão, P., Novais, P., Survivability prediction of colorectal cancer patients: A system with evolving features for continuous improvement, (2018) Sensors (Switzerland), 18 (9), art. no. 2983, .DOI: 10.3390/s18092983

Carneiro, J., Martinho, D., Marreiros, G., Jimenez, A., Novais, P., Dynamic argumentation in UbiGDSS, (2018) Knowledge and Information Systems, 55 (3), pp. 633-669., DOI: 10.1007/s10115-017-1093-6

Nuno Lau

Name: José Nuno Panelas Nunes Lau

Place and Date of Birth: Porto, November 28, 1970

Address: Universidade de Aveiro – DETI, Campo de Santiago, 3810-193 Aveiro, Portugal

Phone: +351 234 370524   **Fax:**   +351 234 370545

Email: nunolau@ua.pt   **Homepage:** http://www.ieeta.pt/~lau

Academic Degrees:

- PhD, Dec 2003, Electrical Engineering, Universidade de Aveiro
- DEA, Set 1994, Biomedical Engineering, Université Claude Bernard – Lyon I
- Graduation, Electrical and Computers Engineering, Fac. Eng. Uni. Porto, 17 val.

Present Position:

- Associate Professor, Aveiro University, since 2020
- Researcher at IEETA, Intelligent Robotics and Systems (IRIS), since 2015

- Principal Investigator of the Intelligent Robotics and Systems (IRIS) research group at IEETA, since 2015
- Vice-President of APPIA – Portuguese Association for Artificial Intelligence

Past Positions:
- Assistant Professor, Aveiro University, since Dec 2003
- Researcher of IEETA, Transversal Activity on Intelligent Robotics (ATRI), 1999-2014
- Assistant Researcher, Aveiro University, 1995-2003
- Stagiary Assistant, Aveiro University, 1994-1995
- Monitor, FEUP, 1991-1993
- INESC-Aveiro researcher, 1994-1999

Teaching courses:
- Aveiro University: Intelligent Mobile Robotics, Distributed Artificial Intelligence, Distributed Systems and Operating Systems, Distributed Computing, Computer Architecture I, Computer Architecture II, Operating Systems, Programming I, Programming II, Introduction to Informatics, Project, Programming Systems and Software Engineering, Seminar
- Porto University: Programming I, Programming II
- MAP-I: Intelligent Robotics, Advanced Artificial Intelligence

Supervising experience:
- 11 PhD, Aveiro University (8), Porto University (2), UTAD (1) (6 concluded, 5 ongoing)
- 29 MSc, Aveiro University (22 finished, 2 ongoing), Porto University (5 finished)
- 16 Final Year Projects, 8 in the area of Robotics, Electrical Engineering and Computer Science graduations, Aveiro University, co-supervisor
- 2 Final Year Projects in the area of Robotics, Porto University, co-supervisor
- 9 Research Scholarships, 7 FCT, 2 IEETA

Area of Scientific Activity:
- Intelligent Robotics, Coordination of Multi-Agent Systems, Reconfigurable Systems

Research Projects:
- FC Portugal: New Coordination Methodologies Applied to the Simulation League (FCT – POSI/ROBO/43910/2002, 27800 EUR, Out 2003 – Out 2004, Coordinator at Aveiro University)
- Rescue: Coordination of Heterogeneous Teams in Search and Rescue Scenarios (FCT/POSC/EIA/63240/2004, 32800 EUR, Abr 2005 – Mar 2007, Principal Investigator)
- POCTI/DIV/2005/00132 - Concurso MicroRato da Universidade de Aveiro: Actividades de Divulgação da Robótica Móvel (member of research team), Jul 2005-Jul 2007
- POSI/ROBO/43908/2002 - CAMBADA - Cooperative and Autonomous Robots with Advanced Distributed Architecture (research team member)
- POSI/CHS/43140/2001 - Confibest - Methods and Models for Problem Oriented Reconfigurable Systems
- PTDC/EIA/70695/2006 - ACORD - Adaptative Coordination of Robotic Teams (member or research team)
- FCT RIPD/ADA/109636/2009 - INTELLWHEELS - Intelligent Wheelchair with Flexible Multimodal Interface, 2010-2012 (coordinator at Aveiro University)
- QREN/ADI - LUL - Living Usability Lab, 2010-2012 (member of research team)
- QREN PRODUTECH PSI, 2010-2014 (member of the research team)
- QREN PRODUTECH PTI, 2010-2014 (coordinator at Aveiro)
- QREN Cloud Thinking, 2013-2015 (coordinator of WP5)
- FP7 EuRoC: European Robotics Challenges, 2014- (challenger team leader), funding Univ. Aveiro of aprox:500k Eur.

Organization of Scientific Meetings:

- Micro-Mouse Robot Contest, Aveiro University, member of Organizing Committee, 2001-2006
- 5th Inter-University Programming Marathon, member of Technical Organizing Committee, Out 2005
- 1st Inter-University Programming Contest, member of Scientific Committee, Mar 2005.
- IROBOT'2005 – 1st International Workshop on Intelligent Robotics, EPIA – Portuguese Conference on Artificial Intelligence, Covilhã, member of Organizing Comittee, 5 Dez 2005
- CiberMouse@RTSS2006 Robotic, Cyber Robotic Competition at Real-Time Systems Symposium, Rio de Janeiro, Brazil, 2006
- IROBOT'2007 – 2nd International Workshop on Intelligent Robotics, EPIA – Portuguese Conference on Artificial Intelligence, Guimarães, Dec 2007
- CiberMouse@RTSS2007, Cyber Robotic Competition at Real-Time Systems Symposium, Tucson, USA, 2007
- Festival Nacional de Robótica 2008, member of the Organizing Committee, Universidade de Aveiro, 2-6 April 2008, http://robotica.ua.pt/robotica2008/
- IROBOT'2008 – 3rd International Workshop on Intelligent Robotics, IBERAMIA – 11th edition of the Ibero-American Conference on Artificial Intelligence, Lisbon, Portugal, Oct 2008
- CiberMouse@RTSS2008, Cyber Robotic Competition at Real-Time Systems Symposium, Barcelona, Spain, 2008
- EPIA 2009 – 14th Portuguese Conference on Artificial Intelligence, Aveiro, 12-15 October 2008, member of the Organizing Committee, http://epia2008.appia.pt
- CyberRescue@RTSS2009, Cyber Robotic Competition at Real-Time Systems Symposium, Washington DC, USA, 2009
- IROBOT'2011 – 5th International Workshop on Intelligent Robotics, held at EPIA'2011 – Portuguese Conference on Artificial Intelligence, Lisbon, Portugal, October 12-15, 2011
- IROBOT'2013 – 6th International Workshop on Intelligent Robotics, held at EPIA'2013 – Portuguese Conference on Artificial Intelligence, Angra do Heroismo, Portugal, October 12-15, 2013
- ICARSC'2014 –IEEE International Conference on Autonomous Robot Systems and Competitions, Espinho, Portugal, May, 2014
- IROBOT'2015 – 7th International Workshop on Intelligent Robotics, held at EPIA'2015 – Portuguese Conference on Artificial Intelligence, Coimbra, Portugal, September, 2015
- IROBOT'2017 – 8th International Thematic Track on Intelligent Robotics, held at EPIA'2017 – Portuguese Conference on Artificial Intelligence, Porto, Portugal, September, 2017

Publications and Communications:

- 1 Thesis, 15 international journal papers, 20 book chapters/series, 20 national journal papers, more than 130 papers in conference proceedings

Program/Scientific Committee in Conferences:

- RoboCup2015, ICARSC2015, EPIA2015, Robot2015, CISTI2015, IWANN2015, SAC2015, ICARSC2014, CISTI2014, FEIM2014, IBERAMIA2014, EPIA2013, EASSS2012, Robotica2012, BIOSTEC2012, CISTI2012, DSIE2012, MASTA2011, IROBOT2011, AI4Games2011, IWANN2011, ICAART2010, CISTI2010, IRSC2009, MASTA2009, IROBOT2009, IWANN2009, CISTI2009, ICAART2009, IbPria2009, IROBOT2008, CISTI2008, AAMAS2008, Robótica2008, MASTA 2007, IROBOT 2007, AAMAS 2007 (Honolulu, Haway), CISTI 2007, AAMAS 2006 (Hakodate, Japan), Robótica 2006 (Guimarães, Portugal), CISTI 2006, IROBOT 2005 (Covilhã, Portugal), MASTA 2005 (Covilhã, Portugal), Robótica 2004 (Porto, Portugal), IROBOT 2007 (Guimarães, Portugal), MASTA 2007 (Guimarães, Portugal)

Reviewer in Journals / other conferences:

- IROS2015, AAMAS2014, IROS2014, ICRA2013, ICRA 2012, ICC2012, IROS2011, RoboCup2011, Transactions on Industrial Informatics, Journal of Autonomous Agents and Multi-Agent Systems, European Journal of Sports Science, Neurocomputing Journal, 9th RoboCup Symposium (Fukuoka, Japan), 8th RoboCup Symposium (Lisbon, Portugal), World Automation Congress 2004 (Sevilla, Spain).

Ten Selected publications:

- Brígida Mónica Faria, Luis Paulo Reis, Nuno Lau. A Methodology for Creating an Adapted Command Language for Driving an Intelligent Wheelchair. Journal of Intelligent & Robotic Systems, February 2015
- João Cunha, Rui Serra, Nuno Lau, Luís Seabra Lopes, António J. R. Neves. Batch Reinforcement Learning for Robotic Soccer Using the Q-Batch Update-Rule. Journal of Intelligent & Robotic Systems, January 2015
- Nuno Lau, Luis Seabra Lopes, Gustavo Corrente, Nelson Filipe, Ricardo Sequeira, "Robot team coordination using dynamic role and positioning assignment and role based setplays", Mechatronics, Elsevier, Vol. 21, n 2, pp. 445-454, ISSN 0957-4158, 2011
- Joao Silva, Nuno Lau, Antonio J.R. Neves, Joao Rodrigues, Jose Luis Azevedo, "World modeling on an MSL robotic soccer team", Mechatronics, Elsevier, Vol 21, n 2, pp. 411-422, ISSN 0957-4158, 2011
- Luis Mota, Luis Paulo Reis, Nuno Lau, "Setplay usage in the Middle Size League", Mechatronics, Elsevier, ISSN 0957-4158, Vol 21, n 2, pp. 434-444, 2011
- Hugo Picado, Marcos Gestal, Nuno Lau, Luis P. Reis, and Ana M. Tomé, "Automatic generation of biped walk behavior using genetic algorithms", Bio-Inspired Systems: Computational and Ambient Intelligence 10th IWANN 2009 Salamanca, Spain, June 10-12, 2009 Proceedings, Part I, University of Salamanca, Spain, pp. 805-812, June 9-12, LNCS 5517, Springer-Verlag, 2009
- Nuno Lau, Luís Seabra Lopes, Nelson Filipe, and Gustavo Corrente, "Roles, Positionings and Set Plays to Coordinate a MSL Robot Team", In: Progress in Artificial Intelligence, 14th Portuguese Conference on Artificial Intelligence, EPIA 2009, Aveiro, Portugal, October 12-15, 2009, Proceedings, LNAI 5816, pp 323-337, Springer, October 12-15, 2009
- Luis Paulo Reis and Nuno Lau, "FC Portugal Team Description: RoboCup 2000 Simulation League Champion", RoboCup-2000: Robot Soccer World Cup IV, Peter Stone, Tucker Balch and Gerhard Kraetzschmar editors, LNAI 2019, págs. 29-40, Springer Verlag, Berlim, 2001
- Luis P. Reis, Nuno Lau, Eugénio C. Oliveira, "Situation Based Strategic Positioning for Coordinating a Team of Homogeneous Agents", Balancing Reactivity and Social Deliberation in Multi-Agent Systems, Markus Hannebauer, Jan Wendler, Enrico Pagello, editors, LNCS 2103, págs. 175-197, Springer Verlag, 2001
- Edited by Peter Stone, with Minoru Asada (humanoid), Tucker Balch (workshop), Raffaelo D'Andrea (Cornell team), Masahiro Fujita (legged), Bernhard Hengst (UNSW team), Gerhard Kraetzschmar (mid-size), Pedro Lima (engineering challenge), Nuno Lau (FC Portugal team), Henrik Lund (RoboCup Jr.), Daniel Polani (scientific challenge), Paul Scerri (simulation), Satoshi Tadokoro (rescue), Thilo Weigel (CS Freiburg team), and Gordon Wyeth (small-size), "RoboCup-2000: The Fourth Robotic Soccer World Championships", AI Magazine, Vol. 22, nº1, págs. 11-38, Spring, 2001

Henrique Lopes Cardoso

Name: Henrique Daniel de Avelar Lopes Cardoso
Place and Date of Birth: Cedofeita, Porto, August 12th, 1974
Address: University of Porto, Faculty of Engineering, Rua Dr. Roberto Frias s/n 4200-465 Porto
Phone: +351914145247 **E-Mail:** hlc@fe.up.pt

Short CV:

Henrique Lopes Cardoso is Assistant Professor at the Department of Informatics Engineering (DEI) of the Faculty of Engineering, University of Porto (FEUP). He is a researcher at the Artificial Intelligence and Computer Science Lab (LIACC) of the University of Porto. He is a member of the Directive Board of the Portuguese Association for Artificial Intelligence (APPIA). He coordinates the Argumentation Hub (ARGH), a multidisciplinary and collaborative lab on Argumentation, in the context of the Media Innovation Labs (UPorto). He is a member of the Advisory Board of the Doctoral Program in Informatics Engineering (ProDEI). He is a member of the Department Council of DEI. He researches in the domain

of Intelligent Systems, including multi-agent systems (MAS), social aspects in MAS (norms, computational trust, incentives, argumentation), multi-agent games exploring social coordination (negotiation, cooperation), tools for programming MAS and agent-based simulation, and knowledge extraction from text (text/argumentation mining). He was Co-Program Chair of the 18th EPIA Conference on Artificial Intelligence (EPIA 2017, Porto, Portugal, September 5-8, 2017). He has served in dozens of program committees in international conferences and workshops. He has been involved in European research networks (e.g. Agreement Technologies, SINTELNET) and in several funded research projects. He is the Principal Investigator of a recently funded national research project (DARGMINTS), the Co-PI in a project with the Portuguese Government (IA.SAE) and currently participates in a P2020 project (QVida+) and in an H2020 project (SIMUSAFE). He has an h-index (Google Scholar) of 15, and an i10-index of 24. He is author or co-author of more than seventy peer-reviewed papers in journals, books and conferences, most of which are indexed in ISI Web of Science, Scopus and Google Scholar. He is the author of 4 software prototypes related with agent-based systems. He has co-supervised one PhD Thesis, and currently supervises three more. He has supervised more than 20 MSc Dissertations, most at FEUP. He lectures courses at the Integrated Master in Informatics and Computing Engineering (MIEIC) and in ProDEI, most of which in the scientific domain of Intelligent Systems.

Academic Degrees:
- Phd, 2011, Eng. Informática, FEUP
- MSc, 1999, Inteligência Artificial e Computação, U.Porto
- Licenciatura (5 Year BSc), 1997, Informática de Gestão, U.Portucalense

Present Position:
- Assistant Professor/Professor Auxiliar (since Jan 2011) at University of Porto/Faculty of Engineering),
- Researcher (since 1997) at LIACC and Member of the Directive Board of LIACC (since 2019)
- Vice-President of APPIA – Portuguese Association for Artificial Intelligence

Past Positions:
- Invited Assistant Professor/Professor Auxiliar Convidado at FEUP, Sep 2009 – Jan 2011
- Invited Lecturer/Assistente Convidado at FEUP, Sep 2005 – Sep 2009
- Lecturer/Assistente at Polytechnic Institute of Bragança (IPB), Dec 1999 – Sep 2005

Pedagogical and Divulgation Activities:

- Teaches mainly in the Integrated Master in Informatics and Computing Engineering (MIEIC) and in the Doctoral Program in Informatics Engineering (ProDEI), both from FEUP. Lectured several courses, most of them in the scientific domain of Intelligent Systems, namely: Logic Programming, Artificial Intelligence, Agents and Distributed Artificial Intelligence, Methodologies for Planning and Scheduling, Electronic Business Technologies, Constraint Programming for Combinatorial Optimization.
- Has developed several pedagogical materials, many of which are the outcome of research activities.

PhD/Postdoctoral/MSc Supervising:
- 1 PhD Thesis supervised concluded and 3 PhD Thesis ongoing.
- 3 Postdoctoral researchers supervised.
- 30 MSc Thesis supervised concluded and 8 MSc Thesis ongoing.

Research Interests:
- Artificial Intelligence, Multi-Agent Systems (MAS), Multi-agent cooperative games, MAS programming and agent-based simulation, Natural Language Processing, Text Mining, Argument Mining.

Five Selected Research Projects:

- *Discourse Analysis and Argumentation Mining from Text Sources (DARGMINTS)*. PI: Henrique Lopes Cardoso. Partners: FEUP/LIACC (proponent), FLUP, INESC-ID. Oct 2018 - Sep 2021. Funded by FCT (FEDER/OE), €233.424,80.
- *IA.SAE – Inteligência Artificial na Segurança Alimentar e Económica (FEUP/ASAE), Funding 125k Eur, Co-PI, 2018-2020.*
- *SIMUSAFE: Simulator of Behavioural Aspects for Safer Transport*. Partners: ITCL, IBM, IFSTTAR, BrainSigns, EFA, MDH, AIPSS, Hok, Prometeo, Progres123, TMSI, Coventry University, Universidade do Porto, LINK, DELPHI, University of Iowa. June 2017 – December 2020. Funded by Horizon 2020 – Research and Innovation Action (RIA) (Grant Agreement number 723386, H2020-MG-2016-2017/H2020-MG-2016-Two-Stages) in €7.991.600,00 (€384.375,00 UPorto).
- *QVida+ /QLife+: Continuos Quality of Life Estimation for effective Clinical Decision Support,* Portugal 2020, PI FEUP, Funding 680k Eur, 2016-2019.
- *European Network for Social Intelligence (SINTELNET)*, David Pearce (UPM, coordinator), 2011-2014, FP7-ICT-2009-C Project No. 286370, member of the Working Group on Social Coordination (WG5).

Publications and Communications:

- *More than 50 papers published indexed at SCOPUS/ISI WoK.*
- *Publications: 2 Theses, 2 editions of Conference Proceedings, 12 Papers in International Journals, 21 Book Chapters/Series (Springer/IEEE), 60 Papers in other International indexed Conferences,*

Program/Scientific Committee in Conferences:

- Main Conference/Workshop Organization: Workshop ArgHumantation (Porto, 2018), 18th EPIA (Porto, 2017), TINMAS (PAAMS, 2012), MASTA (EPIA 2011, EPIA 2001), CeNLPf (Porto 2006, Bragança 2005).
- Main Program Commitees: ICAART (2020-2018), EPIA (2019-2013), PAAMS (2019-2017), AAMAS (2019, 2016, 2013), Text2Story (2019-2018), ADAPTIVE (2019-2011), ICITS (2019-2018), WI (2018-2017), ISMIS (2018-2017), DSIE (2019-2010), COIN (2017-2015, 2010), WorldCIST (2017-2016), ECML-PKDD (2015), ECSI (2014), CLIMA (2014), IAT (2014-2011).

Ten Selected Publications:

- André Cruz, Gil Rocha, Rui Sousa-Silva, Henrique Lopes Cardoso (2019). "Team Fernando-Pessa at SemEval-2019 Task 4: Back to Basics in Hyperpartisan News Detection", in *Proceedings of the 13th International Workshop on Semantic Evaluation (SEMEVAL)*, Minneapolis, Minnesota, USA, June 2019, Association for Computational Linguistics, pp. 999-1003.

- João Marinheiro, Henrique Lopes Cardoso (2018). "Towards General Cooperative Game Playing", *Transactions on Computational Collective Intelligence XXVIII*, Nguyen *et al.* (Eds), LNCS 10780, Springer, pp. 164-192. DOI: 10.1007/978-3-319-78301-7_8.

- Pedro Nogueira, Joana Urbano, Luís Paulo Reis, Henrique Lopes Cardoso, Daniel Castro Silva, Ana Paula Rocha, Joaquim Gonçalves, Brígida Mónica Faria (2018) "A Review of Commercial and Medical-Grade Physiological Monitoring Devices for Biofeedback-Assisted Quality of Life Improvement Studies", *Journal of Medical Systems* (2018) 42:101. DOI: 10.1007/s10916-018-0946-1. [ISI WoS, IF: 2.456, Q2]

- Gil Rocha, Henrique Lopes Cardoso (2018). "Recognizing Textual Entailment: Challenges in the Portuguese Language", *Information*, 9(4):76, Martins *et al.* (Eds), MDPI. DOI: 10.3390/info9040076.

- Gil Rocha, Christian Stab, Henrique Lopes Cardoso and Iryna Gurevych (2018). "Cross-Lingual Argumentative Relation Identification: from English to Portuguese", in *Proceedings of the 5th Workshop on Argument Mining, 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018)*, pp. 144-154, ACL, Brussels, Belgium, November 1, 2018.

- Gil Rocha, Henrique Lopes Cardoso (2017). "Towards a Relation-based Argument Extraction Model for Argumentation Mining", in N. Camelin, Y. Estève, C. Martín-Vide (eds), *Statistical Language and Speech Processing, 5th International Conference, SLSP 2017*, Springer LNAI 10583, pp. 94-105, Le Mans, France, October 23–25, 2017. DOI: 10.1007/978-3-319-68456-7_8.

- Gil Rocha, Henrique Lopes Cardoso (2017). "Recognizing Textual Entailment and Paraphrases in Portuguese", in E. Oliveira, J. Gama, Z. Vale, H. Lopes Cardoso (eds), *Progress in Artificial Intelligence – 18th EPIA Conference on Artificial Intelligence, EPIA 2017*, Springer LNAI 10423, pp. 868-879. DOI: 10.1007/978-3-319-65340-2_70.

- Thiago R.P.M. Rúbio, Zafeiris Kokkinogenis, Henrique Lopes Cardoso, Eugénio Oliveira, Rosaldo Rossetti (2017). "ResMAS – A Conceptual MAS Model for Resource-based Integrated Markets", in *Highlights of Practical Applications of Cyber-Physical Multi-Agent Systems: International Workshops of PAAMS 2017*, Porto, Portugal, June 21-23, 2017, Proceedings, J. Bajo, et al., Editors. 2017, Springer, pp. 117-129. DOI: 10.1007/978-3-319-60285-1_10.

- André Ferreira, Henrique Lopes Cardoso, Luís Paulo Reis (2015). "Strategic Negotiation and Trust in Diplomacy – The DipBlue Approach", *Transactions on Computational Collective Intelligence XX*, N.T. Nguyen et al. (Eds.), LNCS 9420, pp. 179-200, Springer. DOI: 10.1007/978-3-319-27543-7_9.

- Ramón Hermoso, Henrique Lopes Cardoso, Maria Fasli (2015). "From roles to standards: a dynamic maintenance approach using incentives", *Information Systems Frontiers*, 17(4):763-778, Springer. DOI: 10.1007/s10796-014-9523-4. [ISI WoS, IF:1.450, Q2]