MAFALDA FALCÃO FERREIRA, MSC

BIRTH 6/1994 **E** MAFALDAFALCAOTVF@GMAIL.COM **T** 917167101 **ORCID** 0000-0001-5371-0389

Currently a Ph.D. Student in (PRODEI), Researcher and Invited Lecturer at the Faculty of Engineering of the University of Porto (FEUP), and External Collaborator at the Institute for Systems and Computer Engineering, Technology and Science (INESC-TEC). Developing my Ph.D. thesis on tweaking generalist and well-known state-of-the-art models for image classification, resulting in specialized and efficient architectures for medical imaging classification. Special interest in the areas of Data Science, Machine Learning, and Web Development.

Professional experience

★ 2020 — *Researcher*, FEUP { http://www.fe.up.pt }
Grant (BI) for the study and development of computer vision and image processing methodologies for city planning, in the scope of the sub-project 4 (SP4) - *Aplicação de Software* of the project *Safe Cities - Inovação para Construir Cidades Seguras*, *c.f.* POCI-01-0247-FEDER-041435 FEUP.
Supervisor: Prof. Luís Filipe Teixeira (FEUP/DEI)

6/2019 *Teaching Assistant*, The University of Texas at Austin { https://www.utexas.edu/ } & Faculdade de Engenharia da Universidade do Porto { http://www.fe.up.pt }
International Perspectives on Biomedical Engineering Design: a Maymester that aims to enable students to consider sociotechnical factors in designing clinically translatable solutions; students learn human-centered design methods to understand the people for whom they are designing and to identify actionable problem statements. Maymester courses are short-term (4 weeks), faculty-led study abroad programs in which a small group of UT Austin undergraduate students travel with a UT Austin faculty member to an international location (in this case, Porto).

★ 2018 — *Invited Lecturer*, Faculdade de Engenharia da Universidade do Porto { http://www.fe.up.pt }
COMPUTER VISION: fourth year, second semester. A Curricular Unit that aims to introduce to students basic concepts, and classic and advance methods in computer vision.
WEB LANGUAGES AND TECHNOLOGIES: third year, first semester. A Curricular Unit that aims to provide the students with skills in the most significant languages and Web technologies in the current technological context.
OBJECT ORIENTED PROGRAMMING LABORATORY: second year, second semester. A Curricular Unit that aims to provide the students with skills in object-oriented programming and design, employing UML, and upholding good design principles and patterns.

2018 — 19 *Researcher*, INESC TEC { http://www.inesctec.pt }
Grant (BI) for the study and development of methodologies for knowledge extraction from Deep Learning Architectures (DL) and Artificial Neural Networks (ANNs), in the scope of the project ADIRA_I4.0: *Desenvolvimento de soluções tecnológicas e de software Indústria 4.0 aplicadas a bens de equipamento*, *c.f.* POCI-01-0247-FEDER-017922 CESE/INESC TEC.
Supervisor: Prof. Rui Camacho (FEUP/DEI)

2017 — 18 *Junior Researcher*, Fraunhofer Portugal AICOS { http://www.fraunhofer.pt }
Researcher and Developer for the *EyeFundusScope* project, studying *Deep Learning* approaches to Diabetic Retinopathy classification problems[1]

2016 — 17 *Research Assistant*, Fraunhofer Portugal AICOS { http://www.fraunhofer.pt }
Developed a framework for Malaria parasites detection in microscopic images (for the *MalariaScope* project), adaptable to other classification problems.

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[1]Both Fraunhofer Portugal AICOS projects belong to the *Deus Ex Machina* project (DeM), in the Eyes of Internet of Things Competence Center research line (EIT-CC), *c.f.* NORTE-01-0145-FEDER-000026.

2015 — 17 *Teaching Assistant*, Faculdade de Engenharia da Universidade do Porto { http://www.fe.up.pt }
Projeto FEUP, first year, first semester. A Curricular Unit that aims to receive and integrate new coming students, teaching them *Soft Skills* that will be useful for their academic journey and professional future.

Education

★ 2018 — PH.D. Candidate in the Doctoral Program in Informatics Engineering (PRODEI) at FEUP.
Final Curricular Year (1ˢᵗ year) Grade: 18/20

2012 — 17 M.SC. in Informatics and Computation Engineering (MIEIC) at FEUP.
Master thesis: *Statistical Comparison of Different Machine-Learning Approaches for Malaria Parasites Detection in Microscopic Images* { http://hdl.handle.net/10216/106477 }
Final dissertation mark: 18/20. Supervisor: Prof. Luís Filipe Teixeira.

Publications

JOURNALS

2020
Q1
IF 2.745
M. Falcão Ferreira, R. Camacho, and L. Filipe Teixeira, *"Using Autoencoders as a Weight Initialization Method on Deep Neural Networks for Disease Detection."*, BMC Medical Informatics and Decision Making. DOI: { 10.1186/S12911-020-01150-W }[2]

2020
Q1
IF 3.754
M. Falcão Ferreira, J. N. Savoy, M. K. Markey, *"Teaching cross-cultural design thinking for healthcare"*, Special Joint Issue of the journals Artificial Intelligence in Medicine and The Breast. DOI: { 10.1016/J.BREAST.2019.12.015 }

CONFERENCE PROCEEDINGS

2020
CORE B
M. Falcão Ferreira, *"Extracting Architectural Patterns of Deep Neural Networks for Disease Detection: Student Research Abstract"*, SAC 2020 - The 35th ACM/SIGAPP Symposium on Applied Computing (SAC2020). Bnro, Czech Republic. DOI: { 10.1145/3341105.3374224 }

2019 M. Falcão Ferreira, R. Camacho, and L. Filipe Teixeira, *"Autoencoders as Weight Initialization of Deep Classification Networks for Cancer versus Cancer Studies"*, CIBB 2019 - 16ᵗʰ International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics (CIBB-2019). Bérgamo, Italy. { ARXIV:2001.05253 }

2018 M. Falcão Ferreira, R. Camacho, and L. Filipe Teixeira, *"Autoencoders as Weight Initialization of Deep Classification Networks Applied to Papillary Thyroid Carcinoma"*, BIBM 2018 - IEEE International Conference on Bioinformatics and Biomedicine (BIBM-2018). Madrid, Spain.
DOI: { 10.1109/BIBM.2018.8621356 }

2017 M. Falcão Ferreira, L. Filipe Teixeira, and L. Rosado, *"Improving Malaria Parasites Detection in Thick Blood Images: A Statistical Approach"*, INForum 2017 - Simpósio de Informática (INFORUM-2017). Aveiro, Portugal. { INFORUM2017 }

Knowledge Transfer Activities

★ 2021 — *Program Committee Member* of the International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics (CIBB)
CIBB aims to provide a multi-disciplinary forum open to researchers interested in the application of computational intelligence, in a broad sense, to open problems in bioinformatics, biostatistics, systems and synthetic

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[2]Extended version of CIBB-2019

biology and medical informatics. Looking at current trends and future opportunities at the edge of computer and life sciences, the application of computational intelligence to system and synthetic biology, and the consequent impact on innovative medicine will be of great interest for the conference. Theoretical and experimental biologists are also invited to participate in order to present novel challenges and foster multidisciplinary collaboration.

2020
Q1
IF 2.629

Reviewer for International Journal: Data Mining and Knowledge Discovery (DMKD)

DMKD is a Springer journal, focused on the most recent need of computation tools and techniques to help in data analysis. Data Mining and Knowledge Discovery in Databases are rapidly growing research and application areas, that are built upon diverse techniques and theories, such as statistics, databases, pattern recognition and learning, data visualization, uncertainty modelling, data warehousing and OLAP, optimization, and high performance computing. This journal publishes original research and practical work on DMDK, as well as surveys, tutorials, and detailed descriptions of significant applications.

2020
CORE C

Reviewer for International Conference: 17th International Conference on Image Analysis and Recognition (ICIAR)

The International Conference on Image Analysis and Recognition aims at bringing together researchers and practitioners in the fields of Image and Video Processing, Image and Video Analysis and Pattern Recognition, using the latest tools of machine intelligence, connectionist modelling and statistical pattern analysis. This conference addresses recent advances in theory, methodologies and applications. The scientific program includes invited talks by distinguished researchers in the field and fully refereed contributions that are published in the conference proceedings that have been published regularly by Springer in the Lecture Notes in Computer Science series.

★ **2019 —**

Project Committee Member of the VISUM Summer School (VISUM2020)

VISion Understanding and Machine intelligence (VISUM) is a non-profit summer school focused on Computer Vision and Machine Learning fields. This event, organized by INESC-TEC and supported by Portucalense University Infante D. Henrique, targets a broader academic group, from MSc Candidates to Post-Doc scholars and researchers. Besides Computer Vision and Machine Learning, there are other main topics in this summer school, such as Action Recognition in Video, Deep Learning, Explainable Artificial Intelligence, and Information Security.

2019
Q1
IF 6.685

Reviewer for International Journal: IEEE Transactions on Medical Imaging (T-MI)

The focus of T-MI is on unifying the sciences of medicine, biology, and imaging. It emphasizes the common ground where instrumentation, hardware, software, mathematics, physics, biology, and medicine interact through new analysis methods. This journal encourages the submission of manuscripts on imaging of body structure, morphology and function, including cell and molecular imaging and all forms of microscopy.

2018 — 19

Organization Chair of the 14th Edition of the Doctoral Symposium in Informatics Engineering (DSIE19), hosted at FEUP.

The *Doctoral Symposium in Informatics Engineering* is an open event organized by the first year students of PRODEI, where the participant PH.D. students have the opportunity to present their thesis proposals and receive feedback from senior researchers and professors.

Media Coverage

2017

Agência Lusa, *"Tecnologia criada no Porto deteta malária através de imagens obtidas com* smartphones*"*, Portugal. { https://goo.gl/TnGrKj }