MAFALDA FALCÃO FERREIRA, MSC

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

Currently a PH.D. Candidate in (PRODEI), Invited Lecturer at the Faculty of Engineering of the University of Porto (FEUP), and researcher at the Institute for Systems and Computer Engineering, Technology and Science (INESC-TEC). Developing my PH.D. thesis on extracting architectural patterns in Deep Neural Networks applied to disease detection, that can shorten the training time of such topologies while maintaining its good results. 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)

⋆ 2018 — *Invited Lecturer*, Faculdade de Engenharia da Universidade do Porto { http://www.fe.up.pt }
Linguagens e Tecnologias Web, 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.
Laboratório de Programação Orientada a Objetos, 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 }
Scientist 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.

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.

2012 — 17 M.SC. in Informatics and Computation Engineering (MIEIC) at FEUP.

[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.

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

Conference Proceedings

2020 M. Falcão Ferreira, *"Student Research Abstract: Extracting Architectural Patterns of Deep Neural Networks for Disease Detection"*, 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 - 16^{th} 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. { http://inforum.org.pt/INForum2017/docs/comunicacoes-do-inforum2017/ }

Journals

2020 M. Falcão Ferreira, J. N. Savoy, M. K. Markey, *"Teaching cross-cultural design thinking for healthcare"*, Artificial Intelligence in Breast Cancer Care. DOI: { 10.1016/j.breast.2019.12.015 } [2]

⋆ 2019 M. Falcão Ferreira, R. Camacho, and L. Filipe Teixeira, *"Using Autoencoders as a Weight Initialization Method on Deep Neural Networks for Cancer Detection."*, BMC Medical Informatics and Decision Making. *To appear.*[3]

Knowledge Transfer Activities

⋆ 2019 — *Project Committee Member* of the 8th Edition 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.

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

[2] This journal is a joint special issue of the Springer Journals *Artificial Intelligence in Medicine* and *The Breast*.
[3] Extended version of (CIBB-2019)

group of UT Austin undergraduate students travel with a UT Austin faculty member to an international location (in this case, Porto).

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 }