

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> }
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> }
Scientist and Developer for the *EyeFundusScope* project, studying *Deep Learning* approaches to Diabetic Retinopathy classification problems¹.
- 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.

¹Both 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.

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.
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, “*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](https://doi.org/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). Bérghamo, Italy. { [arXiv:2001.05253](https://arxiv.org/abs/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](https://doi.org/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](https://doi.org/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 Disease 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)
VISUM 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 Portuguese 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.
2020 *Reviewer for International Conference*: 17th International Conference on Image Analysis and Recognition (ICIAR)
CORE: C

²This journal is a joint special issue of the Springer Journals *Artificial Intelligence in Medicine* and *The Breast*.

³Extended version of (CIBB-2019)

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

Impact Factor: 7.816

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.

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 — 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> }