Manuel Madeira

Personal Data

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About Me

I am a PhD student at EPFL working under the supervision of Pascal Frossard and Dorina Thanou. My research gravitates around generative modelling, graph deep learning, and how to leverage these to enable scientific discoveries, typically in the biomedical domain.

Education

2022 - Present — PhD. in Machine Learning
École Polytechnique Fédérale de Lausanne, Switzerland

2018 - 2019 (Fall) — Exchange student in Computer Science
Tsinghua University, China

2018 - 2021 — MSc. in Biomedical Engineering
Instituto Superior Técnico, Portugal
GPA: 19 / 20 (**1st** in class), Thesis: 20/20

2015 - 2018 — BSc. in Biomedical Engineering
Instituto Superior Técnico, Portugal
GPA: 19 / 20 (**1st** in class and **1st** ever to attain such grade)

Research Experience

Sep 2022 - Present — **Doctoral Assistant** at EPFL
Studying the incorporation of domain knowledge into graph diffusion models. My research addresses graph generative models and the development of generation evaluation metrics for digital pathology.

Sep 2021 - Aug 2022 — **Machine Learning Researcher** at Inductiva Research Labs
Conducted research on deep learning based approaches to solve partial differential equations. Deployed physics-informed neural networks to model heat diffusion and coastal dynamics and analysed their generalization to arbitrary domains.

Mar 2021 - Jun 2021 — **Research Internship** at Institute for Systems and Robotics
Advisors: Renato Negrinho, João Xavier, and Pedro Aguiar
Researched on L-smoothness exploitation for first-order stochastic optimization methods with theoretical developments on algorithmic analysis.

Sep 2019 - Feb 2020 — **Research Internship** at IST-ID
Transcribed interviews on health technologies assessment in Portugal for the Medi-value Project.

Awards and Honors

2022-23 **EDIC PhD Fellowship**, by EPFL
2016-18 **1st ranked student in Biomedical Engineering BSc**, by Instituto Superior Técnico
2015-20 **Diploma of Academic Excellence (Top 10%)**, by Instituto Superio Técnico
2009-15 **Best student in high school**, by Crédito Agrícola

Teaching Experience

- Network Machine Learning
- Probability and Statistics
- Practice of Object-Oriented Programming
- Analysis I
- Histology

Software Skills

Languages:	Python, Matlab, Java, Mathematica, R
Frameworks:	PyTorch, Keras, Tensorflow, Pandas, Scikit-learn, NumPy, CVX, CVXPY/CVXOPT, Abaqus
Misc:	Unix, Git, Conda, Colab, Tmux, Pueue

Publications

[1] **MM**, D. Thanou, and P. Frossard. **Tertiary Lymphoid Structures Generation through Graph-based Diffusion**. In: *GRAIL Workshop*. MICCAI. 2023.

[2] S. Moalla*, **MM***, L. Riccio*, and J. Lee*. **[Re] Reproducibility Study of Behavior Transformers**. In: *ML Reproducibility Challenge 2022*. Outstanding Paper Award (Honorable Mention). ReScience C. 2023.

[3] **MM**, R. Negrinho, J. Xavier, and P. M. Aguiar. **COCO Denoiser: Using Co-Coercivity for Variance Reduction in Stochastic Convex Optimization**. In: *OPT2021 Workshop*. NeurIPS. 2021.

Extracurricular Activities

2023	Attended Cambridge Ellis Unit Summer School on Probabilistic Machine Learning
2022-	Co-organizer of Deep Learning Sessiong Portugal
2021	Attended Lisbon Machine Learning Summer School
2009-21	Competitive football player (national level)
2015	National finalist in Biology Olympiad

Languages

Portuguese:	Native
English:	C2, TOEFL iBT: 114 / 120
Spanish:	A2
French:	A2
Chinese:	Elementary (Tsinghua course)

Personal Interests

Football, CrossFit, Reading, Cinema