

Manuel MADEIRA

PERSONAL DATA

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ABOUT ME

I am a 3rd-year PhD student at EPFL under the supervision of [Pascal Frossard](#) and [Dorina Thanou](#). My interests gravitate around generative modelling, graph deep learning and how to leverage these to enable scientific discoveries. In my research, I have proposed new generative frameworks for graphs and developed methods that leverage domain knowledge to enhance the controllability and performance of graph generation.

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 Studied the incorporation of structural constraints into graph discrete diffusion models and developed the first discrete flow matching model for graphs. Employed these methods in real-world applications, including molecular generation and 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 SUPERVISORS: 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 .

PUBLICATIONS

- [1] Y. Qin*, MM*, D. Thanou, and P. Frossard. **DeFoG: Discrete Flow Matching for Graph Generation**. In: arXiv. 2024.
- [2] MM, C. Vignac, D. Thanou, and P. Frossard. **Generative Modelling of Structurally Constrained Graphs**. In: NeurIPS. 2024.
- [3] MM, D. Thanou, and P. Frossard. **Tertiary Lymphoid Structures Generation through Graph-based Diffusion**. In: *GRAIL Workshop*. MICCAI. 2023.
- [4] 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.
- [5] 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.

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 Superior 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, Docker, Kubernetes, RunAI

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