Lucas Piper

ML Research Assistant

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Experience

Carnegie Mellon University
11/2025 - 12/2025 — Research Intern — Pittsburgh, PA, USA
- Developing regularizer that uses spatial frequency constraints from fMRI data to improve brain alignment in computer vision models.

Instituto Superior Técnico & INESC-ID
06/2024 - 10/2025 — Research Assistant — Lisbon, PT
- Developed an early-vision CNN module to improve model robustness to image perturbations while mirroring cortical representations.

SHARKCODERS
09/2019 - 04/2024 — Programming Tutor — Almada & Lisbon, PT
- Lectured programming classes and assisted students in developing full-stack web projects and Python applications.

09/2020 - 06/2021 — Administrative Assistant — Almada, PT
- Assisted programming tutors and managed student data.

Education

Instituto Superior Técnico
10/2021 - 11/2024 — MSc in Computer Science and Engineering (Grade: 19/20) — University of Lisbon, PT
- Specialization in Artificial Intelligence and Interaction & Visualization.
- **Thesis**: Using biological features to improve deep neural network models for vision. (Grade: 20/20)
- Relevant courses: Deep Learning; Image Processing and Vision; Planning, Learning and Intelligent Decision Making.

09/2022 - 01/2023 — ERASMUS+ Exchange Program — University of Amsterdam, NL

09/2018 - 08/2021 — BSc in Mechanical Engineering — University of Lisbon, PT

Publications

12/2025 — L. Piper, A. L. Oliveira, and T. Marques, "Explicitly Modeling Subcortical Vision with a Neuro-Inspired Front-End Improves CNN Robustness". **NeurIPS 2025**

Projects

Early Vision Networks
- Developed an subcortical CNN module that improves model robustness to image corruptions, adversarial attacks and distribution shifts, while improving overall model-brain alignment.

2023 IEEE SciVis Contest
- Developed an interactive Python visualization to compare the structure and neuroplasticity of 4 different brain simulations.

Autonomous Transportation Multi-Agent System
- Implemented a study exploring multi-agent system decision-making in autonomous transportation with varying degrees of cooperation by simulating a network of autonomous vehicles aiming to minimize passenger travel time within urban environments.

Extracurricular Activities

Instituto Superior Técnico
11/2024 - 02/2025 — DataScience: Classification MOOC
02/2024 - 07/2024 — DataScience: Knowledge Discovery in Databases Process MOOC

Cova do Mar
03/2019 - 05/2019 — Child Care Worker (Volunteering Project)
- Managed an after-school club by organizing events, resolving conflicts, and maintaining a safe environment.

Portuguese Association for Ethics and Practical Philosophy
06/2017 — National Prize for Essay on Ethics and Philosophy (2nd place)
- Wrote a 6000-word essay on the theme "Are we alone because we use social networks, or do we use social networks because we are alone?".

Young People's Parliament Programme
09/2016 - 03/2017 — School Delegate
- Introduced a bill to be discussed in the Portuguese Parliament on increasing municipality political power.

Skills

Technical Skills
Machine Learning (Python, Numpy, PyTorch, Pandas, Matlab)
Software Development (Java, HTML/CSS, JavaScript, Git)

Language Skills
Portuguese (Native) | English (C2) | German (A1) | Japanese (A1)