

Elior Benarous

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EDUCATION

Harvard University

Boston | Apr 2024 – May 2025

Graduate Research Fellow in Diffusion Models

Computational Robotics Lab (Prof. Heng Yang & Prof. Yilun Du)

ETH Zürich (ETH)

Zürich | 2022 – 2024

MSc Artificial Intelligence & Robotics

Data Analytics Lab (Prof. Thomas Hofmann)

- Relevant subjects: Deep Learning, Computer Vision, Probabilistic Artificial Intelligence

University College London (UCL)

London | 2019 – 2022

BEng Mechanical Engineering

First Class Honours, Ranked 4th in cohort

- Relevant subjects: Machine Learning & Neural Computing, Mathematics, Robotics, Control Systems

PUBLICATIONS & TECHNICAL PROJECTS

1. Image-Editing Specialists: A Multi-Objective Approach for Diffusion Models

E. Benarous, Y. Du, H. Yang

Harvard University, 2024 [Paper]

2. Harnessing Synthetic Datasets: The Role of Shape Bias in Deep Neural Network Generalization

E. Benarous, S. Anagnostidis, L. Biggio, T. Hofmann

Advances in Neural Information Processing Systems Workshop (NeurIPS), 2023 [Paper]

3. Multi-Modal Semantic & Geometric Perception for Off-road Navigation

E. Benarous, D. Atha, M. Hutter

NASA Jet Propulsion Laboratory, 2023 [Talk + Internal research paper pending publication approval]

4. Enforcing Style Invariance in Patch Localization

E. Benarous*, D. Brunner*, J. Manz*, F. Yang*, T. Hofmann

ETH Zürich Data Analytics Lab, 2022 [Paper]

UCL Bachelor Thesis

London | Oct 2021 – May 2022

Lead Research Student

- Built a multi-viewpoint and multi-modal computer vision framework to detect objects flowing on a conveyor and developed the dynamic pick-and-place control of a robotic arm to sort them. Awarded Highest Honours
- Integrated RGB and hyperspectral cameras for precise acquisition of shape, position and material properties

UCL Football Match Forecasting Study

London | Oct 2021 – Jan 2022

Project Lead

- Led a cross-functional team to create an ML model for predicting Premier League football match outcomes
- Crafted a robust pipeline for automated data acquisition and curation, in-depth feature analysis (PCA, correlation), and exploration of diverse model architectures. Attained >60% accuracy and received Highest Honours for the technical report

PROFESSIONAL EXPERIENCE

NASA Jet Propulsion Laboratory Pasadena | Sep 2023 – Mar 2024

Artificial Intelligence Research Intern

- Conducted semantic perception research for the DARPA RACER project, aiming to improve high-speed autonomous driving in complex off-road environments for future Mars & Moon Rover Exploration missions
- Investigated multi-modal outlier detection to improve model safety and robustness in high-risk environments
- Enhanced semantic understanding for traversability forecasting in uncertain terrain navigation

Wasteflow Lausanne | May 2023 – Mar 2024

CTO & Co-Founder

- Founded an AI-driven startup on waste identification to improve recycling. Advised by Prof. Mathieu Salzmann
- Collaborated with the EPFL Computer Vision Lab to manage student research projects and align academic & industry goals
- Directed technical projects and supervised a team of 12 students & engineers to build a detection system using RGB-D data
- Designed a semi-automatic data labelling pipeline using Segment-Anything-Model, achieving a reduction in annotation time of 6x

Greyparrot.AI (Series B Tech Startup) London | July 2022 – Aug 2022

Computer Vision Research Intern

- Developed a high-precision & high-robustness object speed tracking algorithm (error margin: $\pm 0.01\%$ of images' resolution). Software now deployed in 50+ recycling facilities to enhance recycling rates and used as benchmark for future research
- Refined post-processing deduplication for YOLOv5's material detections by implementing classical feature detection, matching, and optical flow techniques. Released this feature in major facilities, including Veolia and Suez
- Evaluated internal ML infrastructure against Google Vertex AI AutoML and presented improvement suggestions to Google

AWARDS

Winner of MIT x AI21Labs Hackathon on agentic LLMs	2024
ETH SEMP Scholar – \$7,000	2023 – 2024
Swiss National Science Foundation BRIDGE – \$150,000	2023 – 2024
Venture Kick Research Fund – \$170,000	2023 – 2024
EPFL Blaze & Ignition Grants – \$45,000	2023
UK Research & Innovation Fellowship Beneficiary	2021 – 2022

SKILLS & INTERESTS

- **Languages:** French & English (Native), German (B2), Chinese (HSK4)
- **Software skills:** Python, MATLAB, ROS
- **Volunteering activities:** Race Against Hunger, Food Bank, Bake-Sale sessions
- **Interests:** Travelling, Environmental & Biomedical technologies, Collective sports