EFIMIA PANAGIOTAKI

DPhil in ML/Robotics | Google DeepMind Scholar | Senior ML Engineer at OXA

Website ⋄ GitHub ⋄ LinkedIn ⋄ Google Scholar

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RESEARCH INTERESTS

Graph Neural Networks, Geometric Deep Learning, Neuro-symbolic AI, Neural Algorithmic Reasoning, Scene Representations, Large Language Models, Introspective Robot Learning, Autonomous Navigation

EDUCATION

University of Oxford, Oxford Robotics Institute (ORI) October 2021 - Present
DPhil in ML/Robotics, Oxford-DeepMind Scholar *Thesis Submission: December 2025*

Supervisors: Prof Daniele De Martini, Prof Paul Newman, Prof Lars Kunze

- Neural execution of classical robotics algorithms using recurrent GNNs, advised by **Dr Petar Veličković**.
- Semantic and spatiotemporal scene graph representations and transformer-based GNNs for navigation.
- Ontology- and knowledge-graph-based retrieval using RAG and LLMs for context-aware search, question answering, and reasoning over large-scale, real-world traffic data.
- Research Lead (3+ years) of the RobotCycle project: egocentric multimodal dataset collection; Led a team of 15 DPhils and engineers. Author of 3 successful research grants.
- Co-supervisor of 7 MEng students and 2 DPhil students.
- Lab Demonstrator: B16 Software Engineering (C++) (2022 - 2025), B14 Computer Vision (2025).

ETH Zürich, Computer Vision Lab (CVL) February - October 2017
Master Thesis, D-ITET *Mobility Student, GPA: 5.25/6.0*

Supervisors: Prof Luc Van Gool, Dr Dengxin Dai

- Development of a lightweight object detection and pose estimation pipeline for semantic boundaries classification as a prior to a visual-inertial SLAM system based on ORB-SLAM and Rovio.
- Design, development, and integration of a prototype Visual Inertial (VI) sensor.

National Technical University of Athens (NTUA) September 2012 - October 2017
MEng Electrical and Computer Engineering (5 years integrated degree)

- AMZ Racing Driverless Formula Student Team: Perception Software Engineer (2017-2018).
- Prom Racing Formula Student Team: Head of Partnerships, Business, and Fundraising (4 years).

PROFESSIONAL EXPERIENCE

OXA (fmr. Oxbotica)
Senior ML Engineer (Part-time), Office of the CTO — *Oxford, UK* *April 2024 - Present*

Member of the CTO's, Prof Paul Newman, research advisory team. Working on scalable representations, mapping, reasoning, and scene understanding.

StreetDrone (acquired by OXA)
Lead Self-Driving Software Engineer (R&D) — *Oxford, UK* *June 2020 - October 2021*

Led all self-driving software research and development efforts, including the 5G-enabled CAL project as part of the 5G Create Scheme for a prototype self-driving truck at the Nissan factory.

- Product Lead; defined technical roadmap, software strategy, and led all feature-development efforts.

· Technical Lead; led the self-driving software team, all customer self-driving software product development efforts, the development of the SaaS product and the open-source software: Project Aslan, featured in **Forbes**.

Software Engineer (R&D) — *Oxford, UK* *June 2018 - June 2020*

Developed a full-stack ROS-based self-driving software for the Nissan ENV200 and Renault Twizy for the SMLL Urban AV Trials, CCAV and Innovate UK project.

· Development of localisation, mapping, object detection, and path planning algorithms.
· Development of the 3–DoF Vehicle Model of the Renault Twizy for Gazebo simulation. project page
· Development of the software communication between ROS and the embedded CAN Bus. project page

Williams Martini Racing, Formula 1 January - June 2018
Data Processing Engineer — *Grove, UK*

· Mathematical modelling for vehicle dynamics and sensor data processing within MAT ATLAS.
· Race Support to performance, race, and strategy engineers during all Formula 1 events.

SKILLS

Technical	**Python** (6+ years), **C/C++** (3+ years), **ROS** (8+ years), **ML/GNNs**, (5+ years)
	JAX, TensorFlow, Pytorch, PyG, RDF/OWL, RAG, LLMs, W&B, DevOps, GCP
Languages	**Greek** (Native), **English** (Fluent), **French** (Basic), **Italian** (Basic)

HONORS AND AWARDS

Queen's Anniversary Prize	Selected to represent the ORI DPhil students at the investiture (2023)
Program Grant	Raised **£xxx,xxx** for the RobotCycle Research Project (2022)
Equipment Grant	Raised **£35,000** for the RobotCycle Research Project (2022)
EPSRC IAA Fund	Strategic Fund, Raised **£25,000** for the RobotCycle Research Project (2024)
PhD Scholarship	**Google DeepMind** Engineering Science Research Scholarship (2021-2025)
Pembroke College	Senior Studentship Award (x1) & Dean of Graduate Funds Award (x2)
Formula Student	1st place overall with AMZ Driverless (Germany 2017)

PUBLICATIONS

Panagiotaki E., De Martini D., Kunze L., & Veličković P. *NAR-*ICP: Neural Execution of Classical ICP-based Pointcloud Registration Algorithms.* (Under Review) paper

Panagiotaki E., Thuremella D., Baghabrah J., Sze S., Fu F., Hardin B., Reinmund T., Flatscher T., Marques D., Prahacs C., Kunze L., & De Martini D. *The Oxford RobotCycle Project: A Multimodal Urban Cycling Dataset for Assessing the Safety of Vulnerable Road Users.* (Journal: IEEE T-FR) paper

Panagiotaki E., Pramatarov G., Kunze L., & De Martini D. *GraphSCENE: On-Demand Critical Scenario Generation for Autonomous Vehicles in Simulation.* (IEEE IROS 2025) paper

Panagiotaki E., Reinmund T., Mouton S., Pitt L., Shanthini A. S., Tubby W., Towlson M., Sze S., Liu B., Prahacs C., De Martini D., & Kunze L. *RobotCycle: Assessing Cycling Safety in Urban Environments.* (IEEE IV 2024) paper

Gadd M., De Martini D., Bartlett O., Murcutt P., Towlson M., Widojo M., Muşat V., Robinson L., Panagiotaki E., Pramatarov G., Kühn M. A., Marchegiani L., Newman P., & Kunze L. *OORD: The Oxford Offroad Radar Dataset.* (Journal: IEEE T-ITS) paper

Panagiotaki E., De Martini D., Pramatarov G., Gadd M., & Kunze L. (2023). *SEM-GAT: Explainable Semantic Pose Estimation using Learned Graph Attention.* (IEEE ICAR 2023) paper

Panagiotaki E., De Martini D., & Kunze L. (2023). *Semantic Interpretation and Validation of Graph Attention-based Explanations for GNN Models.*(IEEE ICAR 2023) paper