

# EFIMIA PANAGIOTAKI

**Availability for internship:** Anytime from January 2024 until completion of PhD studies in June 2025

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## RESEARCH INTERESTS

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3D Spatial Perception, Semantic Localisation, Representation Learning, Scene Understanding, Graph Neural Networks, Foundation Models, Neural Algorithmic Reasoning, eXplainable AI

## EDUCATION

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**University of Oxford, Oxford Robotics Institute**

October 2021 - Present

*DPhil in Engineering Science (PhD)*

*Expected Graduation: June 2025*

**Google DeepMind Engineering Science Research Scholarship**

Supervisor: Dr Lars Kunze, Cognitive Robotics Group

- Projects: Neural execution of odometry estimation and pose graph optimisation SLAM algorithms; Multimodal hierarchical graph representations for semantic localisation using VLMs and GNNs; Natural language explanations using temporal scene graphs and LLMs; Generation of synthetic datasets using heterogeneous GNNs; Explainable semantic GNN-based localisation.
- RobotCycle Project Research Lead and author of 3 x grant proposals
- Supervisor and mentor of 4 students, defining and guiding their research projects
- B16: Software Engineering (OOP, C++) Lab Demonstrator

**ETH Zürich, D-ITET, Computer Vision Lab (CVL)**

February - September 2017

*Master Thesis Visiting Student*

Title: An Efficient Track Detection and Mapping System for an Autonomous Driving Race Car

Supervisors: Prof. Luc Van Gool & Prof. Dengxin Dai

- Development of a lightweight object detection algorithm and perception pipeline for semantic boundaries classification as prior to a visual-inertial SLAM system based on ORB-SLAM and Rovio
- Design, development, and integration of a prototype Visual Inertial (VI) sensor; System design for computational simplicity, focusing on minimizing propagation and transmission latency
- System evaluation and testing in real-world trials under challenging perceptual conditions

**National Technical University of Athens (NTUA)**

September 2012 - October 2017

*MEng Electrical and Computer Engineering, Diploma (5 years Integrated degree, 300 ECTS)*

Major in Electronics and Systems Engineering

- AMZ Racing Driverless Formula Student (FS) Team: Perception Software Engineer (2017)
- Prom Racing FS Team: Head of Partnerships, Business and Marketing Manager (2014-2017)
- EESTEC LC Athens: Member, Robotics Workshop Linköping University

## PROFESSIONAL EXPERIENCE

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**StreetDrone Ltd (PrestonEV)**

*Lead Self-Driving Software Engineer (R&D) — Oxford, UK*

*June 2020 - October 2021*

Leading 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](#). Responsible for defining the technical direction, strategy, and (R&D) goals of the software team.

- Technical Lead; defining the technical roadmap, direct collaboration with the CEO to shape the software strategy of the company

- Team Lead; provided technical expertise and guidance, led the software team to the successful delivery of the 5G-enabled CAL project and various real-world AV demonstrations, as well as the development of StreetDrone's SaaS product and an open-source AV software project [Project Aslan](#)
- Led features development by defining software requirements, high-level architecture (HLA), and low-level software design (LLD)
- Designed and integrated Security requirements (PAS 11281-2018) in liaison with Coventry University
- Established an automated Software Quality Assurance methodology: Software-in-the-loop (SIL), Hardware-in-the-loop (HIL with IPG Automotive), regression testing, unit testing, and CI/CD tools

**Software Engineer (R&D)** — Oxford, UK

June 2018 - June 2020

Developed a full stack open-source self-driving software [\[project page\]](#) for the Nissan ENV200 and Renault Twizy for the SMLL Urban AV Trials, [CCAV](#) and [Innovate UK](#) project.

- Development of object detection and path planning software extending A\* and pure pursuit algorithms using the input from lidar and radar point clouds
- Implementation and evaluation of a robust localization and mapping system using NDT scan matching
- Front-end and back-end development of a UI for the self-driving software and ROS tools using wxGlade and python bindings
- Development of the 3-DoF Vehicle Model of the Renault Twizy for Gazebo simulation [\[project page\]](#)
- Development of the software communication between the ROS framework and the vehicle's embedded CAN Bus, using SocketCAN Protocol for Linux [\[project page\]](#)

**Williams Grand Prix Engineering Ltd**

January - June 2018

**Data Processing Engineer** — Grove, UK

- Sensors data processing within MAT ATLAS framework, using .NET Framework for C# and MATLAB
- Development of a Graphical User Interface (GUI) for vehicle setup using MvVM pattern
- Factory-based Race Support during the official Formula 1 events

## CONFERENCES, HONORS, AND AWARDS

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<b>PhD Scholarship</b>	Google DeepMind Engineering Science Research Scholarship
<b>RobotCycle</b>	Program Grant and Equipment Grant Awards
<b>IEEE ICAR2023</b>	2 x Papers Accepted with Poster Presentations
<b>IEEE ICRA2023</b>	Poster and Highlight Presentation at Explainable Robotics Workshop
<b>Pembroke College</b>	Senior Studentship Award for DPhil studies
<b>Pembroke College</b>	Dean of Graduate Funds Award (x2)
<b>Forbes (2020)</b>	<a href="#">New Open-Source Software Looks To Kickstart The Autonomous Revolution</a>
<b>Formula Student</b>	1st place overall with AMZ Driverless (Germany 2017)

## VOLUNTEERING

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<a href="#">Project Aslan</a>	Co-founder, Lead Technical Steering Committee (2020 - 2021) Open-source self-driving software based on Autoware
<a href="#">Metadrasi</a>	Action for Migration and Development - Mathematics Tutor (2017)

## SKILLS AND INTERESTS

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<b>Technical Skills</b>	Python, C/C++, Docker, ROS/ROS2, PyG, pytorch, NetworkX, git
<b>Languages</b>	Unix Bash, PCL, wxGlade, OpenCV, Matlab, xacro
<b>Personal Interests</b>	<b>Greek</b> (Native), <b>English</b> (Fluent), <b>French</b> (Basic) <a href="#">Hello World!</a> : Technical blog about self-driving cars Harp, piano, drama, running, surfing, travelling

## PAPERS

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George Drayson\*, Efimia Panagiotaki\*, Daniel Omeiza, & Lars Kunze. (2023). CC-SGG: Corner Case Scenario Generation using Learned Scene Graphs. \*Equal Contribution. Under Review [paper](#)

Efimia Panagiotaki, Daniele De Martini, Georgi Pramatarov, Matthew Gadd, & Lars Kunze. (2023). SEM-GAT: Explainable Semantic Pose Estimation using Learned Graph Attention. (ICAR2023) [paper](#)

Efimia Panagiotaki, Daniele De Martini, & Lars Kunze. (2023). Semantic Interpretation and Validation of Graph Attention-based Explanations for GNN Models.(ICAR2023) [paper](#)

Efimia Panagiotaki, Daniele De Martini, & Lars Kunze (2023). Towards Semantic Interpretation and Validation of Graph Attention-based Explanations. (ICRA2023 XRo Workshop) [paper](#)