Panagiotis Liampas

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Education

Massachusetts Institute of Technology, Cambridge, MA May 2028
Candidate for Bachelor of Science in Electrical Engineering with Computing
GPA: N/A
Relevant Coursework: Introduction to Computer Science Programming in Python, Mathematics for Computer Science, Calculus II, Physics II

Mandoulides High School, Thessaloniki Greece May 2023
High School Diploma
SAT: 1550, GPA: 19.8/20.0

Work Experience

Epsilon Orosimo Software, Thessaloniki, Greece September 2023 - October 2023
Junior Software Developer

- Converted and developed custom extension modules for the **Pylon ERP software, using C#**, from another software, enhancing the capabilities and integrating custom operations with regards to the **UI, logic and backend**.

Alpha Systems, Thessaloniki, Greece August 2022 October 2022
Embedded Systems Intern

- Implemented an **IoT weather station**, which is connected using LoRaWAN to the **TTN Network and the Tago.io platform** and presents the data in a dashboard.
- **Cooperated with the Nokia technical team** to integrate them with the **Nokia IOC platform.**

Research Experience

BlueDot Impact AI Safety Fundamentals Alignment Course, Remote May 2024 – June 2024
Independent Research Certificate, GitHub, Article Part 1, Article Part 2

- Conducted a review of various state-of-the-art **Distributional Reinforcement Learning** methods, as well as **risk measures** that can be integrated into the optimization operators of **Q-Learning**, using knowledge of the **distribution of the possible rewards** at a specific state of the agent.
- Evaluated their **effectiveness in decreasing the risk and ensuring the safety of self-driving** cars at worst-case scenarios, by **training a Machine Learning model** in a **simulated highway environment** and capturing the results.

Non-Trivial Fellowship, Remote July 2023 - October 2023
Independent Research Preprint

- Invented "Risk-averse Batch Active Inverse Reward Design", an approach improving upon "Active Inverse Reward Design" in terms of **safety and robustness of AI models** and **reducing uncertain, potentially dangerous behaviors** after deployment, using **Reinforcement Learning from Human Feedback**.

Dr. Kevrekidis (Johns Hopkins), Remote July 2023 - October 2023
Research Collaborator GitHub

- **Trained a Neural Network** (using TensorFlow) to **predict the behavior** of the Reduced MSP Model, from the **dynamical system** described in the paper: "On the parameter combinations that matter and on those that do not".

Dr. Koumoutsakos (Harvard), Remote August 2023 - October 2023
Research Collaborator GitHub

- Implemented a **simulated environment for Braitenberg vehicles**, to examine their interactions with each other, the sources, and certain constrained areas.

Personal Projects

November 2023 - February 2024 Article, GitHub

- Engineered a **3D printed robot** that uses the **Robot Operating System (ROS 2)** and **Simultaneous Localization and Mapping (SLAM)** algorithms to **map, locate itself, and navigate around an unknown area**.

December 2022 - February 2023 GitHub

- Programmed an autonomous robot that can **detect objects, track, and catch them** with its **robotic hand**, using **computer vision and machine learning**.

August 2022 - January 2023 GitHub, Municipality Website

- Implemented a system which uses machine learning to automatically **detect empty parking lots and highlight them on a website**, which was given for **use by the municipality and the local community** to solve the problem of the difficulty finding parking spaces.

July 2022 – November 2022 GitHub

- A system that **measures the humidity of the soil under some plants** and **sends the data to a website** to be used to **determine the amount of irrigation needed**.

July 2018 – August 2019 GitHub

- Implemented a **remotely controlled prototype of a rover** with **integrated sensors** that can potentially be used to determine the habitability of a planet and **show the data, the results and the rover's route in a website, an android app and a windows app**.

Activities & Extracurriculars

MIT Arcturus Autonomous Robotics, Autonomy subteam September 2024 – present

- Setup a Gazebo simulated environment for testing the performance of the robot (that uses the Robot Operating System) in performing certain tasks.

Awards & Accomplishments

Greek Mathematics Team

Silver Medal (1 place from Gold), International Mathematical Olympiad**,** Chiba, Japan July 2023
Silver Medal, International Mathematical Olympiad, Oslo, Norway July 2022
Silver Medal (1 place from Gold), Balkan Mathematical Olympiad, Antalya, Turkey July 2022
Silver Medal, Balkan Mathematical Olympiad, Agros, Cyprus July 2022

Greek Astronomy Team

Bronze Medal, International Olympiad in Astronomy and Astrophysics, remote November 2021

Greek Informatics Team

Bronze Medal, Balkan Olympiad in Informatics, Maribor, Slovenia October 2023
Participation, International Olympiad in Informatics 2021, 2022, 2023
Honorable Mention (2 places from Bronze), Balkan Olympiad in Informatics, remote October 2023

Non-Trivial Fellowship July 2023 – September 2023

Third Prize (4^{th} – 8^{th} place), for designing "Risk-Averse Batch Active Inverse Reward Design"

Programs/Courses

The Knowledge Society Global Innovate, Remote September 2023 – June 2024
Completion

- Studied a broad range of areas and recent developments in various fields.

- Acquired a comprehensive understanding of the methods used to solve global problems, from examining their root causes to refining a concrete idea and plan for their mitigation, and applied them in internal challenges and hackathons.
- Conducted a review wrote an article about the fundamentals of Simultaneous Localization And Planning. Article
- Built a robot that applies the knowledge I acquired from studying the field of autonomous navigation.
- Conducted a review and wrote an article about state-of-the-art methods of LiDAR-Camera fusion, their characteristics and their limitations. Article

Hellenic Institute of Advanced Studies AI Summer School 2024, July 2024
NCSR Demokritos, Athens
Attendance

- Gained a comprehensive understanding of the fundamentals and state-of-the-art methods of Machine Learning, as well as their applications in a wide range of areas and ethical implications.

MITx's Circuits and Electronics XSeries Program, remote July 2024
Circuits and Electronics 1: Basic Circuit Analysis
Circuits and Electronics 2: Amplification, Speed, and Delay Certificate

- Gained a comprehensive understanding of fundamental circuit concepts, analysis techniques, design methods, and applications in various real-world devices, acquiring the tools to be able to apply those in diverse situations and use cases.

Teaching Experience

Mandoulides High School, Thessaloniki, Greece December 2022 - March 2024
Olympiad Preparation Teaching Assistant

- Prepared students at Mandoulides High School for Mathematics and Informatics Olympiads.

Mandoulides High School, Thessaloniki, Greece November 2022 - February 2023
Olympiad Preparation Teaching Assistant

- Mentored the robotics team of Mandoulides High School for their participation in the Greek FIRST LEGO League.

Leadership & Service

Greenpeace Greece, Thessaloniki, Greece September 2023 – August 2024
Project Coordinator

- Organized initiatives to identify all the public water taps of Thessaloniki.
- Organized and participated in awareness campaigns, increase the use of water taps by citizens to refill their bottles.
- Increased the interest and capacity of the team by presenting the project to new members and facilitating their onboarding.
- Got in touch with and convinced certain municipalities to fix the malfunctioning water taps, resulting in their improved state and increased use in many areas.
- Developed the dashboard/map where the usable water taps are presented, including their location, status, and additional information.

Arcturos Wildlife Shelter, Thessaloniki, Greece September 2023 – August 2024
Volunteer 2 weeks, 8 hours/day

- Took care of ~20 Greek Shepherds, by feeding and walking them daily.
- Contributed to various operations of the Bear Sanctuary and the Wolf Sanctuary.

Skills & Knowledge

Language: English (Certificate of Proficiency in English**,** CEFR C2 level), French (Delf, CEFR B1 Level)

Technology

Building & programming **autonomous robots** and **electronics devices/embedded systems**, using **Arduino (C++) & Raspberry Pi (mostly Python, runs on Linux)** and **custom PCB** circuit boards designed with **Fritzing and EasyEDA**, including the integration of **sensors, motors, batteries/solar panels and custom power management circuits**, as well as **3D-printed mechanical parts** & **moving structures** designed using **Fusion 360**. Those are connected to an ecosystem of **websites and databases**, with which data is transmitted (**LoRaWAN, Wi-Fi, or GSM modules**) & processed using **JS, PHP, and SQL**, and accessed/used via a **web app/dashboard** using **HTML, CSS & Bootstrap**, or **Android (Android Studio & Java)** and **Windows UWP or .NET applications (Visual Studio & C#)**.

Knowledge in **Robotics, Localization, Mapping and Planning**, read **"Probabilistic Robotics" by Sebastian Thrun**, and practical experience in using the **Robot Operating System (ROS 2)**, specifically publishing/subscribing to topics, working with various frames & transforms, implementing a **perception/localization/planning/navigation stack** using the respective packages and related nodes, using the **ROS 2 Control framework**, and designing drivers (hardware components) that use **Arduino for communication between the Raspberry Pi and the motors/servos**.

Integration of **Computer Vision and Machine Learning** technologies in autonomous systems, using Python-based frameworks like **OpenCV, TensorFlow, Keras, and PyTorch**, theoretical and practical knowledge of **Q-Learning** and related decision-making algorithms used for determining the optimal policy for a **Markov Decision Process**, including the design, implementation, and evaluation of **risk-averse methods in the field of Reinforcement Learning from Human Feedback**, and ability to design and apply **inverse kinematics and control loop (PID)** mechanisms in an autonomous robot.

Knowledge in **Dynamical Systems** and predicting their evolution, read "Nonlinear Dynamics And Chaos" by Steven H. Strogatz, as well as usage of **Neural Networks for fitting an ordinary differential equation**.

Knowledge in **Braitenberg Vehicles** and their properties, as well as their connection to human psychology, read "Vehicles: Experiments in Synthetic Psychology" by Valentino Braitenberg, and ability to **design physics simulations using Unity**.