PANAGOTIS **LIAMPAS**

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EDUCATION

SEPTEMBER 2024 – MAY 2028
BACHELOR'S DEGREE, MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Undeclared, intended Electrical Engineering and Computer Science major

JUNE 2023
SENIOR HIGH SCHOOL DIPLOMA, MANDOULIDES SCHOOL
G.P.A: 19.8 on a 20.0 scale

JUNE 2020
JUNIOR HIGH SCHOOL DIPLOMA, MANDOULIDES SCHOOL
G.P.A: 19.9 on a 20.0 scale

OLYMPIADS

- **Mathematics**

2023 Silver Medal (1 place from Gold) in the **International Mathematical Olympiad (IMO)** in Chiba, Japan
2022 Silver Medal in the **International Mathematical Olympiad (IMO)** in Oslo, Norway
2023 Silver Medal (1 place from Gold) in the **Balkan Mathematical Olympiad (BMO)** in Turkey
2022 Silver Medal in the **Balkan Mathematical Olympiad (BMO)** in Cyprus

- **Astronomy – Astrophysics**

2021 Bronze Medal in the 14th **International Olympiad in Astronomy and Astrophysics (IOAA)** in Bogota, Colombia.

- **Informatics**

2023 Bronze Medal in the **Balkan Olympiad in Informatics** in Slovenia
2021 Honorable Mention (2 places from Bronze) in **Balkan Olympiad in Informatics** (online)
2021, 2022, 2023 Participated in the **International Olympiad in Informatics**

SKILLS

Language Skills

- English: CPE (C*ertificate of Proficiency in English)* (CEFR C2 level)
- French: Delf (CEFR B1 Level)

Technology Skills

- ***Programming/markup/styling languages:*** C++, Python, JS, PHP, SQL, HTML, CSS (& Bootstrap), Java, C#
- ***Frameworks/tools/software:*** Robot Operating System (ROS 2) (& localization, mapping, and planning packages) & ROS 2 Control (& motor/servo drivers using Arduino), OpenCV, TensorFlow, Keras,

PyTorch, Fusion 360, Android Studio (Android apps), Visual Studio (C# & .NET apps), Fritzing, EasyEDA, Unity

- ***Controllers/electronics:*** Arduino, Raspberry Pi, LoRaWAN, Wi-Fi & GSM modules, sensors, motors, batteries, solar panels, charging modules, MOSFETs, transistors, diodes, capacitors, LEDs
- ***Concepts/fields:*** Localization, Mapping & Planning (SLAM and navigation, "Probabilistic Robotics" by Sebastian Thrun), Q-Learning and decision-making in Markov Decision Processes, Risk-Sensitive Reinforcement Learning and Reinforcement Learning from Human Feedback, Inverse Kinematics, Control Loops (PID), Dynamical Systems ("Nonlinear Dynamics And Chaos" by Steven H. Strogatz) & prediction using Neural Networks, Braitenberg Vehicles ("Vehicles: Experiments in Synthetic Psychology" by Valentino Braitenberg) & physics simulations

INTERNSHIPS

2023 2-month internship at Epsilon Orosimo Software, where I developed custom extension modules for the **Pylon ERP software using C#**, and converted existing ones from another software, that enhance the capabilities and integrate custom operations in the **UI, logic and database** aspects of it.

2022 3-month internship in Alpha Systems and 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. I also **cooperated with the Nokia technical team** to integrate them with the **Nokia IOC platform**.

PROJECTS

Technology and Programming

- I 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**, and evaluated their **effectiveness in decreasing the risk and ensuring the safety of self-driving** cars, in a **simulated highway environment**. (GitHub, Article Part 1, Article Part 2)
- A **3D printed robot** that uses the **Robot Operating System (ROS)** and **Simultaneous Localization and Mapping (SLAM)** algorithms to **map, locate itself, and navigate around an unknown area**. (Article, GitHub)
- 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**. (Website, GitHub)
- An autonomous robot that can **detect objects, track, and catch them** with its **robotic hand**, using **computer vision and machine learning**. (GitHub)
- A system which uses machine learning to automatically **detect empty parking lots and highlight them in a website**, which was given for **use by the municipality and the local community** to solve the problem of the difficulty finding parking spaces. (Municipality Website, System Website, 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**. (Website, GitHub)

RESEARCH

- **Wrote a research paper** called "Risk-averse Batch Active Inverse Reward Design": an improved version of "Active Inverse Reward Design", to **improve safety and robustness of AI models** and **reduce uncertain, potentially dangerous behaviors** after deployment, using **Reinforcement Learning from Human Feedback**.

- 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", under the supervision of Dr. Kevrekidis (Johns Hopkins).
- Implemented a **simulated environment for Braitenberg vehicles**, to examine the their interactions with each other, the sources, and certain constrained areas, under the supervision of Dr. Koumoutsakos (Harvard).

PROGRAMS/COURSES

- **Won the Third Prize (4th-8th place), and $1000 in funding** (and $500 scholarship for all participants), in the Non-Trivial Fellowship, for designing the RBAIRD process described in the research section.
- Completion of The Knowledge Society Global Virtual Innovate program.
- Completion of the BlueDot Impact AI Safety Fundamentals AI Alignment Course (Certificate).
- Attendance of the Hellenic Institute of Advanced Studies AI Summer School 2024.

MENTORING/TUTORING

2022/23 & 2023/24 Preparation for the Mathematics and Informatics Olympiads for students at Mandoulides High School.
2022/23 Mentoring of the robotics team of Mandoulides High School for their participation in the National Robotics Competition FLL.

VOLUNTEERING

- **2023/24** Volunteering at **Greenpeace Greece** team of Thessaloniki, for an initiative to identify all the public water taps of Thessaloniki, inform citizens to use them to fill their own bottles, and convince the municipality to fix the malfunctioning ones. I was part of the **coordinating team** for the volunteers of Thessaloniki, responsible for presenting the project to citizens and municipalities, and organizing initiatives. I was also a (volunteer) **developer of the website** where those water taps are presented, including their location, status, and additional information.
- **2023** Volunteering for 2 weeks at the **"Arcturos"** wildlife shelter, taking care of Greek Shepherds (feeding and walking them) and contributing to the operations of the Bear Sanctuary and the Wolf Sanctuary on November 13th-26th, for 8 hours/day.

ONLINE UNIVERSITY COURSES

Completed the following MITx courses from edX:
- Circuits and Electronics 1: Basic Circuit Analysis
- Circuits and Electronics 2: Amplification, Speed, and Delay (Certificate)