Alexander Pittaras

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Education

Imperial College London **September 2021 – June 2025**
MEng Mechanical Engineering *London, England*
First Class Honours; Dean's List (Top 10% of Cohort)

Reed's School **September 2013 – June 2020**
Secondary Education (A-Levels) *Surrey, England*
A-Levels: 4 A* in Further Mathematics, Mathematics, Physics, Chemistry

Work Experience

Imperial College London **October 2023 – Present**
Undergraduate/Graduate Researcher *London, England*

- Authoring 2 academic papers based on non-destructive testing (NDT); developing final year thesis into publication.
- Conducting research on tribological performance and wear prediction using NDT test data.
- Working with six industrial partners to analyse lubricant performance under simulated forming conditions, including Apple and Schuler.
- In charge of independent system upgrades, including heating and ventilation enhancements.

Black & White Engineering **July 2024 – August 2024**
Mechanical Engineering Intern *London, England*

- Supported cooling layout design for Microsoft and Google data centres, integrating liquid cooling.
- Drafted AutoCAD piping layouts for 16-rack cooling system, reducing design iterations by 30%.
- Automated power usage effectiveness (PUE) reporting, reducing manual updates by 75%.

Qualco **July 2023 – September 2023**
Data Science Intern *Athens, Greece*

- Developed linear and multivariate regression models in Python (scikit-learn), achieving an R^2 score of 0.82.
- Analysed a 398-entry automotive dataset, reducing multicollinearity by 65% using VIF-based feature selection.
- Implemented scikit-learn solutions reducing model training time by 30% without sacrificing predictive accuracy.

Projects

Autonomous NDT Tribological Process Simulator | *CAD, Python, TensorFlow, FEA, Sensors, Cloud* **Present**

- Developed novel automated tribological testing with fresh samples, high-temperature and thin-film lubrication.
- Led and coordinated full hardware design and integration across two external teams; managed the project budget, extensively used tools like CAD and FEA.
- Integrated machine learning and computer vision to predict friction coefficients and detect surface damage from images.
- Built cloud-based data pipeline (AWS) with custom dashboard for real-time tribological metrics.

Natural Language Robotic Programming (Edu-Rob) | *LLMs, ESP32, C++, Web Development* **February 2025**

- 2nd Place at ICHACK25 (750+ participants) in "No-Code/Low-Code Education" and "Best Use of Hardware."
- Parsed natural-language commands with an LLM to generate and validate robot control code.
- Executed code on ESP32 microcontroller via Web Bluetooth and FastAPI with real-time feedback and error handling.

Liquid Rocket (EuRoC) | *Fusion360, FEA, CFD, CNC* **October 2024**

- Designed and manufactured critical liquid rocket components using Fusion 360, and CNC-machined moulds.
- Delivered first successful liquid-propellant rocket launch in EuRoC 3 km category.

Autonomous Vehicle (Third Year Embedded C Project) | *Embedded Systems, Sensors* **December 2023**

- Developed algorithms for a maze-solving vehicle with colour detection in Embedded C, responding to dynamic inputs.
- Placed 1st out of 37 teams by achieving the fastest completion time and meeting the no-interference reliability criterion.

Compressed Gas-Powered Car (Second Year Project) | *SolidWorks, CFD, Additive Manufacturing* **June 2023**

- Designed, simulated and constructed a CO_2-powered vehicle in SolidWorks with CFD and 3D-printed casing.
- Led team to 1st place out of 40 teams, achieving 50+ m by optimizing aerodynamics, weight, and bearing performance.

Technical Skills

Programming: Python (scikit-learn, TensorFlow, PyTorch), C, C++, SQL, MATLAB, HTML, VBA, Git/GitHub
Engineering Tools: SolidWorks, Fusion360, Onshape, ANSYS, ABAQUS, STAR-CCM+
Other: FastAPI, embedded systems (Arduino, ESP32, PICkit)