Joseph V. Azrak

https://www.josephazrak.com

OBJECTIVE

Motivated 4th-year electrical engineering student, on track for a 1st class master's degree, with a strong foundation in data analysis, algorithmic problem-solving, and quantitative reasoning. Seeking a summer internship where I can apply my technical skills and analytical mindset in a dynamic, high-stakes environment.

EDUCATION

- **The University of Edinburgh** — Edinburgh, UK
  Master of Engineering, Electrical & Electronics Engineering — *Aug. 2021 – present*

EXPERIENCE

- **Celestia Technologies Group** — Edinburgh, U.K.
  Engineering Intern — *Summer 2023*
  - **Languages and Tools**: Developed client-side GUIs using Python and Qt while also engaged in embedded firmware programming using C++ for ARM processors. Utilized CAN protocol for communication between the Structure Monitoring box and the PC GUI.
  - **Phased-Array Antenna Calibration**: Engineered a GUI application for the calibration of phased-array antennas. Introduced a novel hierarchical design to handle large-scale systems. Enabled engineers to zoom into individual levels of the system hierarchy, providing heatmaps and 2D representations for better visual understanding.
  - **Structure Monitoring GUI**: Implemented a GUI that connects to an embedded Structure Monitoring box via CAN, providing real-time diagnostics. Monitored key system vitals, such as coolant flows, temperatures, and leak sensors.
  - **In-House Development**: Participated in full-cycle in-house development, from concept to implementation, of antenna hardware and control algorithms, contributing to both software and embedded systems.
  - **Technical Documentation**: Created comprehensive documentation for software modules and calibration procedures, ensuring ease of use and future development efforts.
  - **Project Management**: Worked within an interdisciplinary team to develop, assemble, and test the antenna system.

- **Endeavour Rockets** — Edinburgh, U.K.
  Leader, Avionics Software Team — *2022 – present*
  - **Leadership and Innovation**: Led a team of 5 software engineers in the creation of a state-of-the-art Ground Station, enabling live telemetry over challenging 9 km distances. The station, housed in a rugged Pelican case, featured an embedded Linux stack and touch screen interface.
  - **Data-Driven Telemetry**: Designed and implemented real-time telemetry systems capable of transmitting large data sets over long distances. Developed algorithms to encode data efficiently, emphasising skills in data optimization and analytics.
  - **Embedded Systems**: Wrote mission-critical C++ code for ATmega2560 processors, ensuring maximum efficiency to prevent memory leaks that could compromise the mission. Achieved a robust system capable of interfacing with multiple on-board peripherals like GPS, radio, and accelerometers.
  - **Ground Control System**: Engineered a modular Python-based ground control system running on an embedded Linux stack. The design featured high reliability and allowed for easy upgrades and feature additions.
  - **Hardware Design**: Participated in the design of avionics PCBs, overcoming challenges related to connecting numerous peripherals over a CAN bus.

SKILLS

- **Numerical computing**: data analysis using tools such as Jupyter, Mathematica, R.
- **Programming**: both high-level and low-level with languages such as C/C++, Python, Verilog, Lua, SQL.
- **Electronics engineering**: PCB design, embedded system design, circuit simulation, signal analysis, FPGA implementation
- **Mathematical aptitude**: strong foundation in calculus and discrete mathematics, applied in various engineering and data analysis projects.

Detailed skills

- **Circuit simulation** using the tool LTspice.

- **RTL design** using Verilog and implementation on Xilinx FPGAs.

- **PCB design** using Altium Designer.

- **Data analysis** using Jupyter via Python kernels; interactive visualisation with `matplotlib`, `pandas`, and `scipy`/`numpy`.

- **Statistical programming** using advanced tools such as R and Jupyter.

- **LaTeX/pdfTeX** experience in creating advanced mathematical/statistical reports.

- **Excel** proficiency, especially for engineering and statistical applications.

- **Communication and signal theory** understanding and experience with implementation of communication protocols.

- **I^{2}C, UART, SPI, and CAN** experience, specifically with implementation of sensor networks.

- **Soft Skills**

  - **Leadership and Teamwork**: Proven leadership abilities in high-stakes, technical projects; effective collaborator in interdisciplinary teams.

  - **Analytical Thinking**: Rigorous approach to problem-solving, demonstrated in various engineering challenges requiring quantitative analysis and algorithmic design.

  - **Communication**: Strong written and verbal communication skills; experienced in presenting technical information to non-technical audiences.

  - **Project Management**: Hands-on experience in full-cycle project development, from concept to implementation and documentation.

  - **Adaptability**: Demonstrated ability to learn new tools and technologies quickly, and to apply analytical skills across different domains.

  - **Attention to Detail**: Strong focus on quality and precision in both software development and hardware design tasks.