

Gregory Brooks

4th (Final) Year M.Eng. Electronic & Information
Engineering Undergraduate

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Relevant Experience

- 2018 **Summer Intern, Samsung Cambridge Solution Centre, Cambridge.**
3 month internship, developing WiFi chip firmware within a team of ~10, unit tests (Unity), continuous integration (Gerrit and Jenkins) and debugging tools (all in C).
- 2017 **Summer Intern, TT Electronics, Cambridge.**
10 week internship, modelling high frequency behaviour of PCBs to troubleshoot and suggest techniques for minimising unwanted effects.
- 2016 **Technical Delivery Graduate, BAE Systems Applied Intelligence, Guildford.**
12 week internship, configuring Linux (CentOS) systems using Puppet scripts in addition to general development in C++.
- 2014 **Work Experience Student, Surrey Satellite Technology Ltd., Guildford.**
Two week work placement where I gained experience with Labview as well as being introduced to the various stages involved in satellite design, production and testing.
- 2012 **Work Experience Student, Sperry Marine (Northrop Grumman), New Malden.**
Two week work experience placement, where I was involved in repairing and testing computers returned from the field and writing reports on tested units.

Education

- 2015–2019 **MEng & BA Electrical and Information Sciences (Electronic Engineering), Christ's College, University of Cambridge, 1st (1st year) / 2.1 (2nd, 3rd years).**
- 2008–2015 **A-level Mathematics, Further Mathematics, Physics & Chemistry, Sutton Grammar School, Sutton, 4 A* grades.**

Relevant Skills & Activities

- Co-authored and presented a poster at the EuroSys 2019 conference in Dresden (Gregory Brooks, Yuchao Wang and Phillip Stanley-Marbell. *Safeguarding Sensor Device Drivers Using Physical Constraints. Poster presented at EuroSys 2019, Dresden, Germany.*).
- Enjoy working on hobbyist electronics projects – it is through these projects that I have gained most of my practical engineering skills. Examples include:
 - Ardupilot based UAV project to capture near-infrared imagery of vegetation so that NDVI analysis could be performed to analyse crop health.
 - Apollo 11 guidance computer emulator (with 'DSKY' user interface) using an ARM Cortex-M0 based microcontroller and custom PCB.
 - More information can be found on GitHub (github.com/Gregox273) and my website (gregox.com).
- Worked on several prize-winning hackathon projects, for example:
 - A 'Tamagotchi' style virtual pet that responds to its environment based on measurements from the sensors on an ARM Mbed Cloud Connect board.
 - MQ303 ethanol sensor based device to prevent drunk drivers from unlocking their vehicles.
- Part of the student team that worked on the POSEIDON ocean buoy project at school. This involvement extended into the Triton project, a remotely operated underwater vehicle that won the Google Creative Technology Prize when presented at the national Big Bang Science Fair 2015.
- Familiar with programming in C and Python as well as with the use of Debian, Ubuntu and CentOS.

- Received an Arkwright Engineering Scholarship, sponsored by the ERA foundation.
- I am a core member of Cambridge University Spaceflight society where I have worked on the design, construction, programming and testing/flight of projects such as an inertial measurement unit, GPS/telemetry boards for rockets, lightweight balloon payloads and a time-of-flight trilateration system for tracking a rocket's position during flight.
 - Participating in these projects has developed my ability to write embedded C (working with ChibiOS RTOS running on ARM Cortex-M based microcontrollers) as well as providing an opportunity to learn about schematic and mixed signal PCB design in KiCad EDA.
 - Developed Python backends and GUIs using PyQt for various society projects e.g. the trilateration project mentioned above.
 - Recently been managing a team working on the society's first superpressure high altitude ballooning project, which aims to remain airborne for long enough to circumnavigate the globe. This has provided useful management experience, both in terms of managing a team of people and planning and executing a technical project.
 - Part of the team that launched the society's Martlet 3 rocket at Black Rock desert, Nevada, in 2017.
 - Developed time management and teamwork skills by working on these student projects whilst studying for my degree. Developing flight hardware and firmware has required a strong attention to detail, especially when reviewing the work of other team members.

Master's Degree Project

Title	<i>Compiling Physical Invariant Descriptions to Hardware Descriptions for a Sensor Interface for Security and Privacy in IoT Applications</i>
Supervisor	Dr Phillip Stanley-Marbell
Description	This project involves writing a compiler, in C, that takes a description of physical laws/constraints relating electronic sensor data (e.g. pressure \times volume \propto temperature) and outputs Verilog RTL for use with a low power iCE40 FPGA. This FPGA sits between the sensors and external circuitry, such as a microprocessor, implementing a local differential privacy system which accounts for the physical relationships and hence mutual information between related measurements.

Relevant Degree Modules (Condensed Summary)

First/Second Year

- Mechanics
- Control
- Electrical theory
- Structures
- Mathematics

Third Year

- RF, switch-mode and digital electronics (including VHDL)
- Organisational behaviour
- Signals, systems & control
- Statistical Signal Processing & inference
- Data transmission, information theory & coding

Fourth Year

- Embedded systems
- Software engineering and design
- Management of technology
- Computer vision
- Probabilistic machine learning
- Advanced information theory
- Computer systems
- Radio frequency systems

Languages

English	Native	
French	Basic	GCSE Level
Spanish	Basic	GCSE Level
Cantonese	Basic/Intermediate	Intermediate listening ability
Mandarin	Basic	