Gregory Brooks

Medical Software Consultant at Team Consulting Ltd.

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Relevant Experience

2022 to present **Medical Software Consultant**, *Team Consulting Limited*, Cambridgeshire.

- IEC 62304 compliant software development for medical devices; I've worked as a project software lead at every level of the V-model from early stage system/software architecture to detailed design and implementation, to testing and release.
- Performed early-stage project feasibility assessments and development proposals.
- Applied continuous integration and delivery techniques and technologies to facilitate rapid iterative development cycles and automated testing.
- Designed message-passing APIs for stream based communication between applications.
- Firmware development using FreeRTOS.
- UI development using Flutter (for an Ubuntu-based embedded platform).
- Exploratory work with Rust.
- Sat on the 2024 Winter Party planning committee.

2021 to 2022 **Senior Embedded Software Engineer**, *Signaloid Limited*, Cambridge.

Worked with a wide range of technologies, including:

- AWS IoT services and SDK for streaming sensor data from a BLE enabled IoT device to Signaloid's cloud infrastructure via MQTT.
- High level hardware system architecture for FPGA based compute modules.
- Software development in C and C++ for Signaloid's uncertainty-tracking processor (see github.com/signaloid for examples, including proof-of-concept implementations of A* search and SLAM in one dimension).

2019 to 2021 **Consultant (Embedded Systems)**, *TTP plc*, Melbourn.

Worked on a range of multidisciplinary projects within the Life Science/Cell and Gene team, such as:

- Puckdx sample-to-answer human IVD platform (for DiaSorin).
- CoVent ventilator, a collaboration with Dyson in response to the 2020 'Ventilator Challenge' during the COVID-19 pandemic.

Responsibilities included:

- Hardware (schematic and PCB) design, assembly of prototypes.
- Firmware development for STM32 family, from bare-metal C99 to mutithreaded C++11 with mBed RTOS.
- Software/GUI development in Python (Kivy touchscreen interface for an embedded SBC).
- Testing and debugging of hardware, firmware and software (oscilloscopes, logic analysers, SWD debuggers).
- Implementation, testing and debugging of communications interfaces (RS485, I2C, SPI, Modbus, Ethernet<->TCP<->HTTP).
- Communication and collaboration within a multidisciplinary team.
- Project timeline estimation, prioritisation of tasks to meet aggressive deadlines.

2018 **Summer Intern**, *Samsung Cambridge Solution Centre*, Cambridge.

2017 **Summer Intern**, *TT Electronics*, Cambridge.

2016 **Technical Delivery Graduate (Intern)**, *BAE Systems Applied Intelligence*, Guildford.

Education

2015–2019 **MEng & BA Electrical and Information Sciences**, *Christ's College, University of Cambridge*, *2.1*.

2008–2015 **A-level Mathematics, Futher Mathematics, Physics & Chemistry**, *Sutton Grammar School*, Sutton, *4 A* grades*.

Activities & Awards

- Co-authored and presented a poster at the EuroSys 2019 conference in Dresden *(Gregory Brooks, Youchao Wang and Phillip Stanley-Marbell. Safeguarding Sensor Device Drivers Using Physical Constraints. Poster presented at EuroSys 2019, Dresden, Germany.)*.
- Hobby projects can be found on GitHub (github.com/Gregox273)
- Won Google Creative Technology Prize at the national Big Bang Science Fair 2015.
- Received an Arkwright Engineering Scholarship, sponsored by the ERA Foundation.
- At university, I was 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.
  - Developed Python backends and GUIs using PyQt for various society projects e.g. the trilateration project mentioned above.
  - Part of the team that launched the society's Martlet 3 rocket at Black Rock desert, Nevada, in 2017.

Master's Degree Project

Title *Compiling Physical Invariant Descriptions to Hardware Descriptions for a Sensor Interface for Security and Privacy in IoT Applications*

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)

- Mathematics
- Signal Processing
- Information Theory
- Embedded Systems
- Analogue and Digital Electronics
- Software Engineering