

# Josh Jennings

GRADUATE ELECTRICAL AND ELECTRONICS ENGINEER

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## Education

**Imperial College London** (MENG ELECTRICAL AND ELECTRONIC ENGINEERING )

(Oct 2016 - Jul 2020)

- **Result:** Upper Second Class Honours (2:1)

**Boston Spa School** (SECONDARY SCHOOL AND SIXTH FORM)

(Sep 2009 - Jun 2016)

- **A Levels:** Mathematics (A\*), Further Mathematics (A), Physics (A)
- **GCSE:** 10 Grade A\* to C, including 4 A\*

## Professional Experience

**JavaScript Developer** (ICL DIGITAL LEARNING HUB )

(Jun 2019 - Sep 2019)

- Worked in conjunction with the Digital Learning Hub at Imperial College to create online interactive visualisations to be used with Imperial College's online Machine Learning Masters Degree Course.
- Developed interactive visualisations and tutorials on several different machine learning topics including: support vector machines, stochastic gradient descent, neural networks, and other statistical methods.
- Liaised with lecturers and other academics to make sure visualisations were of an excellent standard.
- Produced fully featured web applications utilising JavaScript (with the plotly and p5 libraries), HTML, and CSS.

**Android Developer** (DEPARTMENT OF CHEMISTRY, IMPERIAL COLLEGE LONDON )

(Jan 2018 - Sep 2018)

- Worked for the Department of Chemistry in an interdisciplinary group to develop a smartphone based biosensor for use with Lateral Flow Assays to detect Vancomycin concentration in blood plasma.
- Implemented using OpenCV and a convolutional neural network to measure colour intensity and map it to a concentration.
- Negotiated with prospective sponsors for project funding, represented Imperial College London at the international SensUs 2018 competition (came 3<sup>rd</sup> in innovation), pitched the biosensor to professionals, and promoted it to the public.
- Developed the application using Java, Android Studio, and OpenCV. Used Python with Keras to generate the neural network model.

## Projects

(MORE DETAILS AVAILABLE ON GITHUB AND MY WEBSITE.)

### • Spiking Neural Network Simulator for Event-Driven Hardware

Utilised C++ and Python to develop a simulator for generating and running spiking neural networks on the Cambridge Computer Laboratory's Partially-Ordered Event-Triggered System. Designed more efficient algorithms that increased efficiency and improved the current implementations. Investigated whether POETS provided sufficient performance gains over conventional architectures.

### • Complex Impedance Analyser

Designed and built a complex impedance analyser using a Nucleo-F446RE, as well as an optional desktop program for using it with computers. Works in a range of frequencies from 1Hz to 1MHz and can differentiate between the types of impedance. Developed using C for the embedded programming, CircuitMaker for designing the PCB, and C# for the companion desktop application.

### • F# Neural Network Library

Created a small library for creating neural networks designed for and built with F#. The library allows for the creation of neural networks of any size with a large selection of activation functions, optimisers, loss functions, and initialisers to choose from.

### • CHIP-8 Interpreter

Developed a small CHIP-8 interpreter using C++ and SDL2. It can accurately emulate CHIP-8 programs and games.

### • Intermittent Claudication Health App

Developed a cross-platform smartphone app using JavaScript with the goal to improve the quality of life for patients suffering from Intermittent Claudication. Leveraged React Native and Firebase to create a social platform that allows patients to exercise together countering the effects of Intermittent Claudication. The patients progress can be monitored remotely by a health practitioner.

## Technical Skills

**Programming** Proficient: C++, Python, F#. Familiar: JavaScript, C#, ARM Assembly, Verilog, MATLAB.

**Miscellaneous** Linux, Git, Embedded Systems Development, PCB Design, Hardware Prototyping, Microsoft Office, LaTeX.

## Other Interests

**Space Society** I helped design hardware for communicating with CubeSats, I have attended conferences and guest lectures.

**Miscellaneous** I'm a keen hiker and have organised group trips throughout Europe. I am also an avid cyclist.