

Josh Jennings

ELECTRICAL ENGINEERING STUDENT

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Education

Imperial College London (MENG ELECTRICAL AND ELECTRONIC ENGINEERING)

(Oct 2016 - Jul 2020)

- **Expected Result:** Upper Second Class Honours.

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 Statistical Methods.
- Liaised with lecturers and other academics to make sure visualisations were of an excellent standard.
- Produced fully featured web pages using JavaScript (with plotly and p5), HTML, and Chrome developer tools for debugging.

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 3rd 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

(FULL DETAILS AND PORTFOLIO AVAILABLE AT JOSHJENNINGS.CO.UK)

• Event Driven SNNs (ongoing)

Designing software for easily generating spiking neural networks for Partially-Ordered Event-Triggered Systems. Developing more efficient algorithms to train the large number of weights in a concurrent system. Comparing performance using the POETS platform to ordinary CPU and GPU based systems. Developed using C++ and XML for the back end and Python for the front end.

• 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.

• Intermittent Claudication Health App

Developed an application using JavaScript to improve 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 whilst being monitored remotely by a health practitioner. Won a prize for the best third year EEE group project.

• Game Boy Emulator

Implemented a Game Boy emulator using F# to further my understanding of computer architecture. It features an instruction stepped CPU to allow for easy debugging, supports different cartridge types, and accurately emulates Game Boy games. Utilised WinForms to provide an optional debug mode that provides the user with information about the state of the memory and registers.

Technical Skills

Programming (proficient): F#, C++, Python. (familiar): C#, ARM Assembly, C, JavaScript, MATLAB, HTML.

Miscellaneous Linux, Git, Arduino and Mbed Development, PCB Design, Microsoft Office, LaTeX.

REFERENCES - AVAILABLE ON REQUEST.