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)
- **Modules included:** High-Level Programming and Artificial Intelligence.

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 academics and continually delivered them software following an agile approach to development and teamwork.
- Produced fully featured web applications utilising JavaScript, HTML, and CSS.
- Utilised continuous integration with Git version control as well as build automation for the deployment of the web applications.

Android Developer (Department of Chemistry, Imperial College London) *(Jan 2018 – Sep 2018)*

- Worked for the Department of Chemistry in an interdisciplinary team consisting of engineers and chemists to develop a smartphone based biosensor for use with Lateral Flow Assays to detect Vancomycin concentration in blood plasma.
- Implemented new algorithms using OpenCV and a convolutional neural network that could measure colour intensity and convert it to a Vancomycin concentration in less time than a full laboratory analysis.
- 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

(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 testing new spiking neural network models on the Cambridge Computer Laboratory's Partially-Ordered Event-Triggered System. Designed better algorithms that increased simulation efficiency and improved the current implementations. Provided tooling for researchers wanting to develop new network models. Investigated whether POETS provided 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.
- **Game Boy Emulator**
  Utilised C++ and the SDL2 library to build a Game Boy emulator. It features debugging tools and accurately runs Game Boy 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 patient's progress can be monitored remotely by a health practitioner. Developed the application as part of a team. Utilised iterative development techniques and regularly peer reviewed code.

Technical Skills

Programming *Proficient*: C++ (including modern standards), Python, F#. *Familiar*: JavaScript, C#, ARM Assembly, MATLAB.

Miscellaneous Linux, Git, Embedded Systems Design, Object Oriented Programming, Agile Development, Software Verification.