

William Powell

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EDUCATION

Imperial College London

October 2023 - Present

Applied Machine Learning MSc

- On track for a Distinction thus far.
- Modules taken: Machine Learning, Self-Organising Multi-Agent Systems, Topics in Large Dimensional Data Processing, Digital Image Processing, Laboratory in Applied Machine Learning, Topics in Control Systems, Deep Learning, Advanced Deep Learning, Computer Vision and Pattern Recognition.
- Final Year Project: Stress Monitoring through the Mastoid: A Feasibility Study for Convenient Personalised Multi-Modal Stress Measurement.

University of Bath

September 2019 – June 2023

Integrated Mechanical and Electrical Engineering BEng (Hons)

- First Class Honours with 75% overall (4.0 GPA). Transcript available [here](#).
- Final Year Project: Design and Implementation of a Single-Lead Chest Strap ECG Recorder for Stress Classification using Lightweight Machine Learning Methods. Available [here](#).

EXPERIENCE

Product Development Contractor and Research Engineer at BrainPatch.ai

June 2021 – Present

- Designed the machine learning pipeline, software, firmware, and hardware to wirelessly stream EEG/ECG data to the cloud.
- Implemented cloud computing / inference using AWS and SQL to process data and transmit it to a web interface in real time.
- Device used in trials for monitoring the real-time participant biosensing information remotely. Now integrating it into a commercial machine learning consumer product to detect stress.

Software Engineer Intern at AB Dynamics

September 2021 – August 2022

- Embedded lead for a new MISRA compliant product using CAN for the various peripherals of the STM32 microcontroller. Device developed and launched to customers in six months, sold at £10k per piece.
- Identified the vast potential for using vestibular stimulation on the static driving simulator that could emulate dynamic motion and integrated a brain stimulation device with the physics of the driving simulator to create the sensation of rotational forces (roll, pitch, yaw).
- Research project still being investigated at AB Dynamics in collaboration with BrainPatch.

Founder and CEO of PhoneCave (phonecave.co.uk)

November 2019 – September 2020

- Created a start-up, PhoneCave, that aims to get people off their phones.
- Designed circuitry, casing, firmware, electronics to produce a commercial product.
- Shipped PhoneCaves to over 10 countries worldwide, held a promotional campaign on Kickstarter, and sought investors.

PROJECTS

Contribution to Open Source Machine Learning Accelerator Framework [Code Available Here](#)

- Contributed to the integration of runtime optimizations such as TensorRT and ONNXRuntime into a PyTorch based Machine-Learning Accelerator System Exploration Tools (MASE).
- Aims to combat the pace of development of ML software models which is much faster than accelerator design cycle, rendering many accelerators obsolete, see paper.

Design of a Self-Organising Multi-Agent System [Code Available Here](#)

- Co-lead the infrastructure team to design a base platform architecture for 70+ students to utilize.
- Six publications are currently being written using the system environment.

COVID Volunteering - 3d Printing PPE for National Health Service

- Collaborated in a 3d printing community to print PPE for NHS staff. Saved an estimated 20,000 additional face shields due to slicer optimizations.

Programming a Chess Engine with Artificial Intelligence [Code Available Here](#)

- Programmed a chess game environment and engine, implementing Minimax Recursion, Negamax, and Alpha Beta Pruning, with variable search depth. Optimized using transposition tables through Zobrist hashing and move prioritization algorithms.

TECHNICAL SKILLS

Languages: English (native), Russian (B1), French (B1)

Programming Languages: C, C++, Python, Golang, MATLAB, Julia, JS, ReactJS, Bash, System Verilog, VBA.

Computer Skills:

- **Deep Learning:** PyTorch, TensorFlow, Keras, OpenCV, MASE.
- **Developer Tools:** Git, Linux, Docker, VMs, RTOS, HPC, Cloud Computing (AWS), Databases (SQL, NoSQL).
- **Engineering:** Networking (TCP/IP, UDP), PCB Design (Altium, Eagle), CAD (Autodesk Inventor, Solidworks, NX, Fusion 360), Multiphysics Simulation (Simulink, Comsol, ModelSim).

ACTIVITIES AND INTERESTS

- **Neural Interfaces:** From restoration of spinal cord diseases, treating neurodegeneration, or cognitive enhancement, the potential of BCIs have intrigued me.
- **Triathlon:** Represented Bath University at BUCS level, ran 2 marathons, several half marathons, competed in an Olympic distance triathlon, and aim to complete an Iron Man.
- **Skiing:** Skied with French locals for 5 years, achieved 'Or' in GSs, and freeride skiing with Thibaud Duchosal.
- **Sailing:** Helmed at RS Feva Nationals, Assistant Dinghy Instructor, Flotilla Lead Boat Crew, RYA Day Skipper.
- **Duke of Edinburgh Awards and Cadet Camps:** Completed Bronze, Silver, and Gold DofE, 2 Marine camps, 2 Army cadet camps.
- **Other Interests:** Photography, golf, chess, investing, and philosophy, particularly Stoicism and Existentialism.