AARUNI ARORA

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EDUCATION

Imperial College London *(Ongoing) Oct 2020 - Jun 2025*
MEng in Biomedical Engineering with a Year in Industry *Grade: Expected First*
Focus in Electrical and Computational Engineering Pathway

- Relevant Modules: Brain-Computer Interfaces, Reinforcement Learning, Image and Signal Processing, Animal Robotics, Optimisation, Linear Algebra, Probability and Statistics, Modelling in Biology.
- Undergraduate Teaching Assistant (UTA) for Programming 1 (*Year 3*) and Embedded Systems (*Year 4*).
- *Volunteer experience*: Imperial Bioscience Review (*published articles*); Taekwondo ITF/WT Judge; Dance-based charity events; Hackathons; Vice President of Poetry Society (*Year 2*).

RESEARCH EXPERIENCE

Brain and Behaviour Lab **London, UK**
Master's Thesis - Final Year Individual Project *(Ongoing) Oct 2024 - Jun 2025*

- Facilitating EEG data collection and analysis of neural markers for at least 40 participants.

Dr Ferrari's Lab at LSE **London, UK**
Undergraduate Researcher (part-time) *(Ongoing) Aug 2024 - Present*

- Assisting in managing a health economics project on 'Violence against Women', including grant writing.

Traverso Lab at MIT and BWH **Boston, MA, USA**
Research Trainee (full-time) *Jan 2024 - Jul 2024*

- Involved in a DARPA-funded project focused on optimising the PCB design of a smart pill in Altium.
- Implemented Python-based feature extraction algorithms on heart and respiratory signals for data analysis.
- Labelled animal videos for machine learning models, attaining >80% inter-rater reliability amongst the team.
- Fabricated a lightweight (~100g) wearable device for EEG data collection on SolidWorks. (pending publication)

Vaccine and Immunotherapy Center at Harvard Medical School and MGH **Boston, MA, USA**
Visiting Research Scholar (full-time) *Jul 2023 - Dec 2023*

- Secured over £4000 in Turing Scheme Grant to do a Year in Industry in the USA by the UK government.
- Contributed to and standardised protocols for JDRF-funded research and lab work on type 1 diabetes.
- Processed >100 islet and H&E images on ImageJ and executed statistical analysis for Flow Cytometry.
- Improved islet transplantation effectiveness in murine models from a 10 to a 30-day graft survival, through interdisciplinary collaboration with reputable institutes. (pending publication)

Imperial College London **London, UK**
UROP at the Dept. of Brain Sciences with UK Dementia Research Institute (part-time) *Nov 2022 - Mar 2023*

- Observed research on temporal interference in brain stimulations to master mice neuromodulation.
- Processed over 7 mouse brains, and trained students on microtome sectioning, confocal imaging, etc.

GROUP PROJECTS

HeartReach: A Low-Cost Imperial Bioengineering Outreach *Oct 2022 - Jun 2023*

- Devised an innovative tool with Unity Game Engine, Augmented Reality (AR) and Arduino technologies to elevate interest in and awareness of bioengineering-based solutions in GCSE students, working in a team of 5.
- Organised a pilot study to assess the interest of GCSE students in products similar to HeartReach and analysed a ~70% increase in the engagement rate post-product interaction.

DinoMaze: AR Educational App Development for Cerebral Palsy (CP) Students *Nov 2022 - Jan 2023*

- Collaborated on developing a 3D AR-based educational app for children aged five and above with CP GMFCS Levels 3 to 5 using Unity and Visual Studio (C#) to meet the client's, The Pace Centre's, criteria.
- Programmed an engaging quiz-based maze to improve critical thinking, problem-solving and collaboration skills by at least 5% among children using DinoMaze.

Hydrotherapy Device for Kids with Cerebral Palsy (Co-Project Lead/Manager) *Oct 2021 - Jun 2022*

- Co-engineered a floatation device for adolescents (≤75kg), enabling sports therapy and social interaction.
- Promoted the adaptable mechanical device to 3 potential clients at the National CP Swimming Competition in Nottingham and received positive feedback.

SKILLS

Languages: Arduino, C#, LaTeX, MATLAB, Python (Jupyter, Matplotlib, NumPy, Pandas, SciPy)
Software: Altium, Canva, FlowJo, GraphPad, GitHub, ImageJ, LAS X, LTSpice, OrCAD, SolidWorks, Unity
Lab: 3D Printing (PLA, Resin), Circuitry, Confocal and Tissue Microscopy, ELISA, Flow Cytometry, Microtome, Silicone Moulding, Oscilloscope, Soldering, Western Blot
Certifications: Digital Signal Processing and Analysis (*April 2024*); PyTorch for Deep Learning (*Ongoing*)