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 Class

- Specialisation in Electrical and Computational Engineering pathway of Bioengineering.
- Relevant Modules: Brain-Computer Interfaces, Reinforcement Learning, Image and Signal Processing, Animal Robotics, Optimisation, Linear Algebra, Probability and Statistics, Modelling in Biology.

Scottish High International School *Apr 2012 – Jul 2020*

International Baccalaureate Diploma Programme Grade: 42/45

RESEARCH EXPERIENCE

Brain and Behaviour Lab London, UK

Master's Thesis - Final Year Individual Project (full-time) *(Ongoing) Oct 2024 - Jun 2025*

- Facilitating data collection for a VR-based experiment comparing reward versus sensory error-based learning.
- Conducting comprehensive analyses of event-related potential markers across a minimum of 40 participants.

Dr Ferrari's Lab at LSE London, UK

Undergraduate Researcher (part-time) *(Ongoing) Aug 2024 - Present*

- Supporting the management of an interdisciplinary health economics project on 'Violence against Women'.
- Drafted an excel sheet identifying potential funders and eligibility criteria, contributing to grant writing efforts.

The Lab for Translational Engineering at MIT and BWH Boston, MA, USA

Research Trainee (full-time) *Jan 2024 - Jul 2024*

- Labelled videos on Boris for machine learning models, attaining >80% inter-rater reliability amongst the team.
- Fabricated and 3D printed a custom lightweight (~100g) EEG headset using SolidWorks (pending publication).
- Adapted the CAD model for a smart pill casing and optimised the PCB design in Altium, integrating a hall effect switch for improved functionality.
- Customised a Python-based pipeline for heart and respiratory rate signal acquisition, denoising, filtering, feature extraction, and visualisation.

Vaccine and Immunotherapy Center at Harvard Medical School and MGH Boston, MA, USA

Visiting Research Scholar (full-time) *Jul 2023 - Dec 2023*

- Optimised and standardised protocols for JDRF-funded research on Type 1 Diabetes, increasing reliability.
- Ran confocal imaging of cells and tissues samples to evaluate over 100 images on ImageJ and CellProfiler.
- Executed statistical and graphical analyses with Python, GraphPad, and FlowJo for Flow Cytometry (BD LRSFortessa and Cytek Aurora), contributing to cytokine profiling and transfection assessments.
- Enhanced islet transplantation outcomes in murine models, increasing graft survival from 10 to 30 days through interdisciplinary collaboration.

Interventional Systems Neuroscience Lab London, UK

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

- Participated in research on temporal interference in brain stimulations, focusing on murine neuromodulation.
- Advised students in essential lab techniques, including microtome sectioning and confocal imaging.

AWARDS AND HONOURS

Turing Scheme Grant for Year in Industry *Aug 2023 - Jul 2024*

PUBLICATIONS

Dogan, Fatma, et al. "345.3: Immunoisolation and Islet Survival in the Absence of Systemic Immune Suppression Enabled by Co-Delivery of CXCL12 and FasL Containing Microgels in Allo-Islet Transplanted Diabetic Mice." *Transplantation*, vol. 108, no. 9S, Sept. 2024, doi:10.1097/01.tp.0001065724.81662.c2.

Aaruni Arora et al. *Reforestation in Brazil.*

ENGINEERING PROJECT EXPERIENCE

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

- Innovated an interactive outreach tool utilising Unity Game Engine, Augmented Reality (AR), and Arduino.
- Engaged with outreach experts to help elevate interest in and awareness of bioengineering-based solutions like pacemaker in GCSE students.
- In partnership with a team of 5, organised a pilot study demonstrating a ~70% increase in engagement rates among GCSE students' post-interaction with HeartReach.

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

- Collaborated on developing a 3D AR educational app tailored for children (ages 5+) with CP using Unity (C#).
- Programmed an engaging quiz-based maze that aims to improve critical thinking, problem-solving and collaboration skills by at least 5% among children for our client, The Pace Centre UK.

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

- Designed an adjustable floatation device for adolescents (≤75kg), aiding sports therapy and social interaction.
- Successfully promoted the mechanical device to 3 potential clients at the National CP Swimming Competition in Nottingham and received positive feedback.
- Coordinated regular meetings, maintained detailed documentation and delegated tasks to ensure effective team-work among a group of ten.

LEADERSHIP AND VOLUNTEERING EXPERIENCES

Imperial College London London, UK

Undergraduate Teaching Assistant (part-time) *(Ongoing) Oct 2022 - Dec 2024*

- Facilitated learning in Embedded Systems Labs by addressing queries and mentoring approximately 60 second-year students on Arduino and Raspberry Pi.
- Led introductory training sessions on Quartus Prime v16 and Python for about 70 first-year students.

Stint UK London, UK

Hospitality Team Member (part-time) *Nov 2022 - Mar 2023*

- Improved interpersonal and time-management skills in dynamic environments (restaurants, cafes, events).

Poetry Society at Imperial College London London, UK

Vice President (part-time) *Oct 2021 - Jun 2022*

- Boosted society engagement at the college's welcome fair, increasing membership by 7 individuals.
- Organised thematic poetry reading/writing sessions, cultivating a safe and creative space for idea-sharing.

Imperial Bioscience Review London, UK

Student Member (part-time) *Oct 2020 - Oct 2021*

- Authored two articles highlighting intriguing biological concepts related to DNA and cancer.
- Contributed to a report on Reforestation in Brazil as a member of the Halden Group.

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*)
Interests:	Cycling, Dance (Indian Classical – Bharatnatyam), Taekwondo