

# Intishar Alam Misbahul

intisharalam@outlook.com | Github | LinkedIn | +447928189195 | intisharalamdev.vercel.app

## Research Profile

Recent First Class Honours MEng graduate in Electrical and Electronic Engineering from Imperial College London, seeking to pursue doctoral research in biomedical electronics and circuits. Final year project developed a wearable, multi-sensor rehabilitation system combining embedded systems, sensor fusion, and closed-loop haptic feedback for musculoskeletal rehabilitation, supervised by Prof. Paul Mitcheson. This builds on coursework in Biomedical Electronics (87.76%) and Full-Custom Integrated Circuit Design (71.05%, taught by Prof. Constandinou), alongside independent analogue IC design work (8-bit current-steering DAC, 45 nm CMOS, Cadence Virtuoso). Seeking a PhD position at the intersection of implantable/wearable medical devices, analogue/mixed-signal circuit design, and embedded signal processing.

## Education

**Imperial College London** 2022 – 2026

MEng Electrical & Electronic Engineering (EEE)

First Class Honours — overall mark 70.86%. Year 3: 81.10%, Year 4: 70.09%.

- **Relevant modules:** Biomedical Electronics (87.76), Power Electronics (89.00), Semiconductor Devices (87.00), Analogue Integrated Circuits and Systems (71.25), Full-Custom Integrated Circuit Design (71.05), Embedded Systems (77.88), Computer Vision and Pattern Recognition (73.15), Robotic Manipulation (79.05)
- **Individual Project** (70.65): “Wearable-Guided Home Rehabilitation for Frozen Shoulder” — multi-sensor IMU wearable, BLE streaming, real-time 3D motion reconstruction, closed-loop vibrotactile haptic feedback. Supervisor: Prof. Paul Mitcheson

**Mulberry Stepney Green Maths, Computing, and Science College** 2020 – 2022

A-Levels: Computer Science (A\*), Pure Mathematics (A\*), Physics (A\*), Chemistry (A)

## Research & Project Experience

**Final Year Project — Wearable Rehabilitation System for Frozen Shoulder** Oct 2025 – June 2026

Individual Project, Imperial College London

- Designed a multi-sensor IMU wearable streaming motion data via BLE to a companion app for real-time 3D reconstruction.
- Built closed-loop vibrotactile haptic feedback to confirm reps, flag range-of-motion limits, and correct compensatory movement.
- Reconstructed shoulder motion in real time from 3-node IMU fusion, enabling adaptive, personalised exercise progression.
- **Skills:** Embedded systems, BLE, sensor fusion, real-time signal processing, hardware design, human-centred design.

**Full Custom IC Design — 8-bit Current-Steering DAC** Oct 2025 – Dec 2025

Individual Design Project, Imperial College London

- Designed an 8-bit current-steering DAC in 45 nm CMOS using Cadence Virtuoso.
- Implemented binary-weighted current mirrors and segmented architecture to improve linearity.
- Verified performance via DC and transient simulations, meeting key specifications.
- Developed schematic and partial layout using common-centroid and symmetry; performed DRC/LVS checks.
- **Skills:** Analogue IC design, Cadence, CMOS, DACs, layout, circuit simulation.

**Power Factor Correction Board** Jan 2025 – Apr 2025

Electronics Team Member, Imperial College London

- Designed and simulated a boost PFC circuit and implemented PCB layout in Altium Designer.
- Assembled hardware, validated open-loop operation, and evaluated efficiency under varying conditions.
- Developed and tuned digital control algorithms for closed-loop voltage regulation on a microcontroller.
- **Skills:** Power electronics, PCB design (EasyEDA), LTspice simulation, embedded control, hardware validation.

## Embedded Systems Project — Music Synthesiser

Jan 2025 – Apr 2025

Software Team Lead, Imperial College London

- Developed firmware for a digital music synthesiser, implementing core audio generation and control logic.
- Designed and programmed oscillators, envelope generators, filters, and modulation modules in C++.
- Integrated digital audio output and timing control to generate waveforms and manage real-time constraints.
- **Skills:** Embedded software, C++, real-time signal processing, PCB design and layout, audio synthesis, hardware validation.

## Research-Relevant Work Experience

### Trainee Electronics Engineer

Apr 2025 – Sept 2025

DCA Design International

- Characterised current consumption of a medical device under multiple configurations to model battery performance.
- Evaluated and benchmarked sensors for potential integration into inhaler devices.
- Designed and assembled an evaluation PCB using Altium Designer for system testing.
- Developed, simulated, and prototyped an analogue circuit with LTspice to validate performance.
- **Skills:** Altium Designer, analogue circuit design, embedded systems, Python, and hardware validation.

### Freelance PCB Designer

Nov 2025

Start-up company (Freelance)

- Designed a compact PCB, achieving dense routing for large components in a tight space.
- Managed the full workflow: schematic capture, PCB layout in KICAD, fabrication coordination, and assembly.
- Delivered a fully assembled board within 2 weeks, meeting strict functional and mechanical requirements.
- **Skills:** High-density PCB layout, component placement optimisation, end-to-end hardware delivery.

## Technical Skills

- **Circuit design & IC layout:** Cadence Virtuoso (custom analogue/mixed-signal IC design), Altium Designer, KiCAD, EasyEDA, LTspice
- **Embedded systems:** STM32, RP2040, Arduino, C/C++, real-time signal processing, BLE
- **Electronics:** Power electronics, analogue circuit design, sensor systems and sensor fusion, semiconductor device physics
- **Software:** Python, MATLAB, machine learning fundamentals

## Teaching & Outreach

### Education Officer

Autumn 2025 – Present

Imperial College Robotics Society (ICRS)

- Led technical workshops on embedded systems, PCB design, prototyping, and CAD.
- Ran sessions on 3D printing, mechanical assembly, and safe use of fabrication tools.
- Coordinated educational events to support members' practical learning in robotics and electronics.

### Recruitment & Outreach Student Ambassador

Autumn 2023 – Present

Imperial College London

- Tutored and mentored Year 11–12 students in STEM subjects, strengthening technical communication skills.
- Designed and delivered hands-on electronics prototyping and maker-based workshops for school groups.
- Supported the Imperial Makerspace programme, guiding project development and safe use of fabrication tools.

## Awards & Distinctions

- First Class Honours, MEng Electrical and Electronic Engineering, Imperial College London (2026)
- Imperial Award (Foundation): Initial Reflection Stage
- In2research Programme Participant