

Arnav Aggarwal

Mechatronics & Robotics Engineer

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EDUCATION

University of Leeds — BEng (Hons) Mechatronics and Robotics

Conferred 3 July 2026

First Class Honours. First Class Honours is the highest classification awarded by UK universities.

SELECTED MODULES Intelligent Systems and Robotics 88 · Embedded Systems Project 87 · Electronic Circuit Design 81 · Engineering Mathematics 80

Pathways World School Aravali — IB Diploma

May 2023

Physics HL 6, Mathematics AA HL 6, Computer Science HL 6, Chemistry SL. Three Group 4 sciences — Physics HL, Computer Science HL, Chemistry SL — alongside Higher Level Mathematics.

EXPERIENCE

Aginova Technologies Pvt. Ltd. — Robotics Engineering Intern

Jul – Sep 2025

Pune, India (US parent company)

- Led end-to-end design and delivery of a custom heavy-lift drone in a two-person team: 15 lb payload capacity, 20-minute flight time, under \$5,000 build cost.
- Delivered the payload and endurance specification of a \$14,000 commercial platform on a bill of materials under \$5,000, excluding our own labour.
- Carbon fibre frame; trade-off analysis across propulsion, battery configuration and propeller sizing to optimise thrust-to-weight.
- Custom mounting mechanism for a refrigerated payload module — secure attachment, load distribution, vibration isolation.
- Full electrical integration: flight controller wiring, ESC configuration, power distribution. Component sourcing across India and China.

Yaskawa India Pvt. Ltd., Robotics Division — New Product Development

Jun – Aug 2024

Interbar, India

- Designed and prototyped a robotic tapping machine in SolidWorks — a robot tending cell, one arm serving two stations — with an adjustable mounting system spanning Ø26–38 mm on one set of tooling, 40% of the commercial bottle-cap range, taking 5% out of the per-assembly manufacturing cost against the manual process through automated threaded fastener application with integrated torque sensing.
- Designed a camera-equipped end effector for industrial robots, applicable across arc welding, spot welding, painting and pick-and-place.
- Calibrated 6-axis industrial robots: Tool Centre Point calibration, residual within ± 0.1 mm over four approach directions.
- Conducted field analysis at the Honda plant in Tapukara, Rajasthan, evaluating real-world automation deployment.

17 Squad Ltd. — Engineering & Cybersecurity Intern

Jun – Nov 2021

- Researched SEO strategies and cryptographic hashing algorithms for data protection.
- Developed SolidWorks proficiency for engineering design.
- Wrote a comparative paper on Hashcat brute-force performance against SHA-256 and SHA-512.

PROJECTS

Low-Cost Shaft Eccentricity Monitoring

Dec 2025 – Apr 2026

University of Leeds, MECH3895 Individual Project

- Designed, built and validated a stray-flux magnetometer instrument for shaft eccentricity in rotating machinery: two orthogonal MLX90393 magnetometers, 498 Hz angle-synchronous acquisition on an ESP32-S3 with an AS5600 encoder, and a Python pipeline doing 20-revolution angle-synchronous averaging and harmonic-order extraction.
- Mean absolute magnitude error 10.6% against a 15% target, with a GUM uncertainty budget giving an expanded uncertainty of $80.9 \mu\text{m}$ at $k=2$. Both classifiers separated healthy, static and dynamic eccentricity on all 30 repeats. Instrumentation cost £148.55 against £1,500–2,000 for an equivalent eddy-current installation.

iMechE UAS Challenge — Project Manager

Oct 2025 – Jun 2026

University of Leeds

- Led Gryphon Arrows, a team of 15+, to design and build an autonomous fixed-wing aircraft (max 10 kg) for iMechE's international competition.
- Managed a £1,300+ budget and secured £1,000 in sponsorship; coordinated mechanical, electrical and software systems for GPS waypoint navigation and precision agricultural delivery within ± 2 m accuracy.

Dual-Microcontroller DOOM Game Engine

Dec 2024 – Jun 2025

University of Leeds, ELEC 2645

- Architected an embedded game engine on ESP32-S3 (240 MHz) and STM32L476RG with custom inter-processor communication — 40 MHz SPI framebuffer transfers, 921,600 baud UART synchronisation — reducing rendering latency by 60% against a single-processor implementation.

— 97/100 on the project. 87 overall for the module.

Gyroscopic Electricity-Generating Tennis Ball

Sep 2023 – Feb 2024

Personal project

- Kinetic energy harvester inside a regulation Ø68.6 mm tennis ball: a two-axis gimbal holds an inertial mass near-stationary while the shell rotates around it, so magnets on the gimbal pass fixed coils on the shell wall and generate current by induction. Charges an internal lithium cell.
- Packaging drove the design — a gimbal, four coils, four arc magnets, a cell and a charge circuit inside a Ø52.2 mm cavity, holding a 1.0 mm airgap. The prototype produced measurable output during impact testing.

Reversible X2 — Adaptive clothing

Aug 2022 – Aug 2023

House of Keller, Delhi

- Adaptive clothing designed for visually impaired users. Also redesigned the organisation's website in WordPress and HTML.

UNIVERSITY — SOCIETIES AND POSTS

Leeds University Union Spoken Word Society — Poet of the Year

2024 and 2025

University of Leeds

- Spoken word, performed. Voted rather than applied for, and won twice.

Vibes, Bollywood dance society — Treasurer

2025 – 2026

University of Leeds

- Held the society budget: subscriptions, event costing and showcase spend.

COMMUNITY

The Inclusive Network — Founder & Coordinator

2021 – 2023

Pathways World School Aravali

- Campus-wide inclusivity initiative across four disability sectors (locomotor, visual, hearing, mental): accessibility ramps at 20+ stairwell locations, a buddy system for visually impaired students, and menstrual health infrastructure in primary school facilities.

Shreeji Sewa Sanstha — Secretary & IT Head

Jul 2021 – Jul 2022

Delhi

- Built an SQLite RDBMS for a 500+ volunteer database; coordinated fundraisers, cleanliness drives and spoken English programmes across city-wide NGO operations.

AWARDS, PUBLICATION AND TESTS

- AFS Nationals Debating Competition — 1st Prize, Best Speaker, 2023. · Poet of the Year, LUU Spoken Word Society, 2024 and 2025. · Pathways Chairman's Award, 2022–23. · ISSO Nationals Tennis Championships U-17 — 4th, Team Event, 2022.
- Published July 2022, IJRAR: a sustainable self-cleaning toilet system integrating hygiene automation, renewable energy, minimal water use and waste-to-fertiliser treatment.
- IELTS 8.5 · SAT 1450 (790 Maths, 660 English).
- Cryptography: A Hands-on Approach — Udemy, 11 hours, February 2023.