

# YUXUAN ZHOU

## Design Engineering | Intelligent, Interactive & Sustainable Systems

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### PROFILE

Imperial College London MEng Design Engineering student working across machine learning, computer vision, software, embedded systems, product design, CFD, FEA and sustainability. Built a competition-winning autonomous football robot, an 88.6%-accuracy Random Forest classifier and a tested JavaScript tactical game. Open to placements developing intelligent, interactive and engineered products.

### EDUCATION

#### Imperial College London — MEng Design Engineering

London, UK | Expected Jun 2028

Relevant study: Data Science, Computing, Electronics, Embedded Systems, Mechanics, Thermofluids, Materials, CAD and Human-Centred Design.

### PROFESSIONAL EXPERIENCE

#### Refuta — Analyst Intern

Jiangsu, China | Jul–Aug 2025

- Audited a warehouse data-management workflow and evaluated five software platforms against encryption, authentication, data control, compliance and usability criteria.
- Synthesised findings into a stakeholder recommendation report and documented material fire-resistance testing.
- Redesigned the corporate PowerPoint template around its visual identity, improving consistency across layout, typography and information hierarchy.

### AI, SOFTWARE & EMBEDDED SYSTEMS

#### AI Football Robot — Individual Project

Jan–Apr 2026

- Built an end-to-end perception-to-actuation system that detected footballs and goals, selected pursuit directions and drove a mobile robot autonomously.
- Trained an Edge Impulse computer-vision model on approximately 1,300 images, deployed it through OpenMV IDE and integrated MicroPython motor control.
- Iterated the complete system through live testing and won first place in Imperial's 3v3 robot-football competition.

#### Ecological Modelling with Machine Learning — Team Project

Apr–Jun 2025

- Trained a Random Forest classifier in MATLAB, achieving 88.6% validation accuracy on the seven-class UCI Covertype dataset.
- Analysed feature relationships and class-level performance while addressing imbalance; F1 scores exceeded 0.90 for five classes and 0.70 for the two most confusable classes.

#### Wulin: 2D Tactical Roguelike Web Game — Individual Project | [GitHub](#) | [Play](#)

May–Jun 2026

- Built a browser-based 10 × 10 tactical roguelike in vanilla JavaScript, HTML and CSS, with turn economy, terrain constraints, combat, victory/defeat states and enemy pathfinding.
- Designed 11 data-driven martial-arts skills; separated JSON balance/map data, immutable game-state rules and DOM rendering.
- Documented the public game API and wrote 32 Mocha unit tests covering movement, skills, combat and enemy behaviour; all 32 pass.

#### Dancing Self-Balancing Segway — Team Project

Jan–Apr 2026

- Developed a self-balancing robot that recognised drum beats and mapped them to stored motion commands.
- Programmed 125 ms interrupt-based MicroPython sampling with Hall-effect wheel-speed sensing and motor feedback; demonstrated the integrated system at a university exhibition.

#### Electronic Piano — Team Project

Apr–Jun 2025

- Programmed a MicroPython input-and-synthesis pipeline that mapped key presses to musical-note frequencies and LED feedback.
- Assembled and debugged the circuit board, integrated hardware and software and produced a working demonstration video.

### PRODUCT, EXPERIENCE & SUSTAINABILITY DESIGN

#### The Path: Queen's Lawn Social Space — Team Project

Jan–Jun 2025

- Combined on-site observation, surveys and interviews with students and staff to define year-round needs for seating, shelter, study and social interaction.
- Iterated modular and foldable elements through sketches, CAD, a 3D-printed scale model, a 1:1 cardboard mock-up and campus feedback.

#### Shoes of Infinity: Transformable Footwear — Individual Project

Oct–Dec 2024

- Researched customer needs and benchmarked multi-purpose footwear, then generated 15 hand-drawn concepts for interchangeable activity-specific soles.
- Selected a buckle-and-slide architecture by comparing durability, cost, comfort and ease of use; built a cardboard-and-fabric proof of concept from deconstructed footwear.
- Produced final renderings, material/process analysis and an exhibition poster for the university showcase.

## PRODUCT, EXPERIENCE & SUSTAINABILITY DESIGN — CONTINUED

### Modular Pet-Waste Cleaning Tool — Team Project

Jan–Apr 2026

- Synthesised interviews with Chinese pet-content creators and UK animal-welfare organisations to identify workload, hygiene and usability pain points.
- Generated 15 concepts and developed a portable modular system with interchangeable cleaning heads, informed by product and mechanism benchmarking.
- Produced the Fusion 360 assembly, exploded-view communication and campaign-style renders for the final concept.

### Sustainable Modular Aircraft Seat — Team Project / Individual Portfolio

Sep–Dec 2025

- Disassembled a full-scale retired aircraft seat and produced a bill of materials covering materials, manufacturing and end-of-life pathways.
- Redesigned the seat for lightweighting, repair, material separation and tool-light disassembly; Granta Eco Audit estimated 41.1% lower mass, 34% lower lifecycle energy and 38% lower carbon footprint.

### Light-Responsive Kinetic Lamp — Team Project

Sep–Dec 2025

- Translated a flower-opening metaphor into a responsive mechanism using LDR input and motorised motion.
- Integrated Fusion 360 CAD, a 3D-printed mechanism and electronics; tested the complete prototype and exhibited it at a university showcase.

## AUTOMOTIVE, MECHANICAL & MATERIALS

### Vehicle Aerodynamics & EV Battery Thermal Management — Team Project

Jan–Apr 2026

- Developed an individual SUV concept achieving Cd 0.286 in CFD across 10–30 m/s, analysing pressure distribution, flow separation and wake behaviour.
- Compared the individual CFD outcome with wind-tunnel results from the team-selected 3D-printed concept (Cd 0.31), identifying differences between simulation and physical testing.
- Iterated a dual-inlet, parallel-channel aluminium cold plate in Fusion 360 and Ansys Discovery; CFD predicted 42.5 °C average / 46.6 °C maximum temperature, 710.6 W heat removal and 15.1 Pa pressure drop.

### Prosthetic Running Blade FEA — Individual Project

Jan–Apr 2026

- Compared equivalent-isotropic CFRP with Aluminium 2014-T4 in ANSYS Workbench under static, modal and fatigue loading.
- Raised the converged CFRP fundamental frequency from 97.2 Hz to 147 Hz while reducing deformation and peak stress; verified result stability through mesh refinement.

### Electric Shaver Reverse Engineering — Individual Project

Apr–Jun 2025

- Reverse-engineered a Braun electric shaver, documenting component materials, manufacturing processes, joining methods and product architecture.
- Used Ansys Granta EduPack to compare lifecycle energy and carbon impacts and proposed alternatives balancing cost, manufacturability and sustainability.

### Inclined-Tube Rebound Experiment — Individual Project

Nov–Dec 2024

- Designed a five-angle mechanics experiment with ten repeated trials per condition, removed outliers and estimated floor coefficient of restitution through drop testing.
- Derived and differentiated a force-based model to estimate the inclination angle that maximised rebound height, documenting assumptions and limitations.

## TECHNICAL SKILLS

**Machine Learning & Computer Vision:** Classification, preprocessing, class imbalance, feature analysis, model evaluation and visualisation; Edge Impulse and OpenMV IDE.

**Programming & Testing:** Python, JavaScript, MicroPython, MATLAB, HTML/CSS, JSON, Git, GitHub and Mocha.

**CAD & Visualisation:** Fusion 360, Rhino 3D, Blender, Figma, Adobe Photoshop, Illustrator and InDesign, Procreate and Microsoft Office.

**Simulation & Sustainability:** ANSYS Workbench and Discovery; CFD, conjugate heat transfer, static/modal/fatigue FEA, mesh convergence and Ansys Granta Eco Audit/EduPack.

**Research & Prototyping:** Interviews, surveys, observation, insight synthesis, experimental design, concept sketching, embedded circuits, sensors, motors, 3D printing and full-scale mock-ups.

## ADDITIONAL INFORMATION

**Languages:** Mandarin Chinese (native), English (fluent; IELTS 8.0), Spanish (B1).

**Interests:** Robotics, computer vision, interactive systems, video games and travel.