Yusuf Khan

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EDUCATION

MEng Mechanical Engineering | University College London *2022 – 2026*

- Upper Second Class Honours (2:1), with a minor in Nanotechnology.
- Major project: hull, wing sail and control system design for an autonomous sailing vessel for the Microtransat Challenge.
- Relevant modules: Advanced Thermodynamics and Fluid Mechanics; Data-Driven Methods for Engineers; Manufacturing and Design; Engineering in Extreme Environments.

A-Levels | Brampton Manor Academy *2020 – 2022*

- A* Mathematics; A Further Mathematics, Physics, Chemistry.

TECHNICAL SKILLS

CAD & Design: Autodesk Fusion 360 (advanced), SolidWorks, CATIA V5; part and assembly modelling, kinematic joints, 2D detail drawings, design for manufacture
Analysis & Simulation: FEA (ANSYS, ABAQUS), CFD, stability and hydrostatics, MATLAB, Simulink
Manufacturing: Composite layup and mould manufacture, CNC machining, additive manufacture, laser cutting, workshop fabrication
Electronics & Control: PCB design (KiCad), Teensy and Arduino, sensor integration, PID control, LabVIEW, data acquisition
Programming & Software: Python, MATLAB, C++; database-backed systems deployed on Linux and Raspberry Pi
Currently developing: GD&T and tolerance stack-up analysis to ASME Y14.5-2018

PROJECTS

MEng Project: Autonomous Sailing Vessel | UCL *Sep 2025 – Aug 2026*

- Developed the hull geometry with CFD and FEA against drag and structural-load criteria, then manufactured it by 3D printing in sections and laying up fibreglass over the exterior.
- Designed and developed a self-trimming wing sail, using a tail vane to set the wing's angle of attack to the wind.
- Designed the control PCB in KiCad (manufactured by JLCPCB) and wrote all control and autonomy software: a cascaded PID autopilot, waypoint planning and tracking, and power management.
- Lake tested with the full system installed; remote-controlled sailing and autonomous waypoint following were both successful.

Rover Wheels, Suspension and Robotic Arm | UCL Rover *2023 – 2025*

- Co-designed an airless TPU wheel with the mechanical structures team, consulting Xometry engineers through the team's sponsorship; six wheels were produced by SLS.
- Designed the carbon fibre suspension differential bar, sizing it with FEA and CNC machining a high-density foam mould for the layup.
- Designed a six degree of freedom robotic arm as part of the arm and chassis team.

Quad-Turbo V12 Engine | Personal project *2026 – present*

- Designed a quad-turbocharged V12 engine from scratch in Fusion 360, modelling the full assembly with kinematic joints so the mechanism runs.
- Building it as a scale model: block and camshaft banks laser cut; camshafts, valves, crankshaft and pistons 3D printed and assembled.

Hydrogen Combustor Instability Research | UCL, with an industry partner *Sep 2024 – Jun 2025*

- Investigated thermoacoustic instability in a model hydrogen gas turbine combustor: instrumented the test rig, developed a dual-loop active control system in LabVIEW and processed the test data in Python and MATLAB.

EXPERIENCE & LEADERSHIP

Drone Lead | UCL Rover *Sep 2025 – Aug 2026*

- Led the design and build of the team's quadcopter from concept to flight test, using FEA to assess vibration response under motor loading.

Team Lead | UCL Rover *Aug 2024 – Aug 2025*

- Led a 29-member core team across seven subteams to deliver a Mars rover for the European Rover Challenge 2025 against a fixed deadline.
- Coordinated mechanical, electrical and software subteams, presented at design reviews and resolved interface issues during integration and testing.
- Introduced a structured CAD review process, reducing redesign time by approximately 15%.

CAD & Fabrication Mentor | MechSpace, UCL *Feb 2024 – Aug 2026*

- Trained students in CAD, additive manufacture and CNC machining, maintained workshop equipment, and delivered STEM Racing workshops for school groups.
- Built and deployed a Raspberry Pi barcode sign-in system and a Notion-backed stockroom checkout, used by over 800 students.

Private Tutor | Bright inTuition *2020 – 2026*

- Tutored GCSE Mathematics and A-level Mathematics, Further Mathematics, Chemistry and Physics.