

Zayn Toosy

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PROFILE

Final-year MEng Biomedical Engineering student drawn to the gap between what engineering can do and how much of it reaches patients - particularly in orthopaedics, where younger patients are often pushed towards invasive procedures when better-engineered alternatives should exist. Self-taught to an advanced level in SOLIDWORKS, including FEA, motion studies, animated assemblies, and production-ready technical drawings. Used to working from first principles across novel experimental platforms, and comfortable using AI tools to compress the time between an idea and a working result without substituting them for engineering judgement. Looking to contribute to implant design, biomechanical modelling, or surgical instrumentation in a role close to a clinical outcome.

EDUCATION

Imperial College London – MEng Biomedical Engineering

Oct 2022 – June 2026

Key Modules – **Orthopaedic Biomechanics** ; Design for Additive Manufacturing ; **Biomedical Computational Stress Analysis** ; Advanced Biomaterials ; Non-ionising Functional and Tissue Imaging

Whitgift School

2010 – 2022

A Levels (3A*) – Maths, Biology, Physics ; EPQ (A) ‘The Rise of AI in Healthcare’ ; Academic Scholar

PROJECTS

Clevis Fixture Design and FEA Stress Analysis

Spring 2025

- Designed a 6061 aluminium clevis fixture in SOLIDWORKS for tensile testing a prosthetic arm terminal device, connecting a rod end bearing to a testing machine through a 5 mm steel pin under a worst-case 1.5 kN tensile load.
- Original design failed under load; redesigned by removing material from non-load-bearing regions and resolving stress concentrations identified in SOLIDWORKS Simulation.
- Verified the final design against a safety factor of 2.5 against yield, with fatigue assessment over 1000 test cycles.

Automated Experimental Platform for Bumblebee Cognition Research

Sep 2025 – 2026

Department of Life Sciences, Imperial (ongoing)

- Designing modular interlocking maze components and a customised hive box in SOLIDWORKS, optimising wall thickness, tolerances, and assembly interfaces for FDM 3D printing and rapid reconfiguration between experimental conditions.
- Building automated reward delivery and RFID-based identification systems on Arduino microcontrollers to synchronise sensing, actuation, and data logging across the platform.
- Using animated SOLIDWORKS assemblies to walk biologists through design iterations is often clearer than written description for collaborators.

Focused Ultrasound Delivery of Anaesthesia Through the Blood-Brain Barrier

Oct 2024 – June 2025

Department of Bioengineering, Imperial

- Contributed to a targeted drug delivery system using focused ultrasound and microbubbles to transiently open the blood-brain barrier for localised anaesthetic administration.
- Identified workflow bottlenecks and proposed design improvements through SOLIDWORKS technical drawings and animated assemblies including a redesigned zebrafish holder that improved mounting stability, visual clarity, and ultrasound passage.
- Wrote diagnostic MATLAB software to troubleshoot transducer calibration, reducing setup time and enabling consistent sonication parameters. Validated delivery via patch clamp electrophysiology in rat brain slices and zebrafish.

Accessible Appliances for Neurodegenerative Clients

2019

- Designed and 3D printed a contactless lamp with hands-free reflective dot tracking, applying ergonomic and user-centred design principles to maximise independence for individuals with neurodegenerative conditions.

EXPERIENCE

UROP: Undergraduate Research

July 2023

Tanaka Group, Imperial

- Worked alongside PhD researchers using MATLAB to model bacterial competition dynamics, investigating whether non-pathogenic mutants could treat atopic dermatitis by outcompeting virulent *S. aureus* strains.
- Presented findings and a literature review to the multidisciplinary research team.

Clinical Volunteer

2020 – Present

Park Road Medical Centre

- Five years inside a GP practice assisting with COVID-19 and flu vaccinations, shadowing consultations, and observing referral pathways which has given me a concrete sense of the gaps in patient care that engineering can address, particularly in orthopaedics.

Pharmacy Volunteer

July 2025

H.E. Matthews Pharmacy

- Assisted with prescription dispensing under regulatory compliance, and managed stock rotation, inventory checks, and supply chain coordination to maintain service continuity.

SKILLS AND INTERESTS

CAD & Simulation: SOLIDWORKS (FEA, motion studies, technical drawings, animated assemblies), FDM 3D printing

Software: MATLAB, Python, Arduino, LaTeX, DaVinci Resolve — **Other:** Cinematography, Photography