TOBIAS E KUNZ

Medical devices | RAEng scholar | Materials + Design

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EXPERIENCE

R&D MECHANICAL/DESIGN ENGINEER (PAID WORK)

Siemens Healthineers MRI Magnet Technology, Oxford
(July 2024 - 2025)

- Designing and validating safety and support components to comply with regulations
- **Design for manufacture** of safety and support components to improve scalability and minimise cost
- Designing and implementing **test rigs** to create digital twin of novel carbon fibre suspension bands saving £1,000s in outsourcing
- Vibration testing of flexible bodies to verify compliance with transport safety standards
- **Modal analysis** of novel components key to Siemens' upcoming magnet
- Processing magnetic field test data with **Python** to contribute to a digital twin

ARM TEAM LEAD (UNIVERSITY SIDE PROJECT)

Sheffield Bionics (Sept 2022 - 2024)

- **Rebuilt** and **led** 15 person multidisciplinary project building **above elbow myoelectric prosthetic arm** for a **real patient** within 1 year. Recruited new student team and wrote proposals to obtain **funding**.
- **Mechanical design** of compliant hand and 360° wrist movement
- Wrote **Arduino** code for manual override of wrist control.
- Rapid prototyping via **additive manufacture**. Materials selection, 3D printer operation and repair.
- Built rapport with disenfranchised patient into strong working relationship
- Included **patient perspective** into design process for **human factors**
- Facilitated patient's physiotherapy, patient quote: "you've helped me feel **free** in my body"
- Technical **presentations** to external stakeholders e.g. sponsors
- Cross-disciplinary **project management,** servant leadership
- Developed understanding of electronics, motor neuron signal processing eg time delay neural network.

DESIGN ENGINEER (UNIVERSITY SIDE PROJECT)

Hacksessible (Summer 2024)

- Designed bespoke toys for children with brittle bone disease - team project
- **Design for strict user requirements**: lightweight (utilised 3D printing infill); facilitating creative play (fun farm themed design); easily graspable (added durable "ears" to the design)
- Concept generation, CAD, DfM for additive manufacture
- Generated prototype with team within a **weekend hackathon**
- Product commended by **medical professionals** at Sheffield Children's Hospital

SKILLS

- **CAD:** Solidworks, SiemensNX, Fusion360
- **FEA:** Ansys (mechanical, thermal), Simcenter Nastran
- **Machine shop:** Turning, welding, milling, technical drawing
- **Rapid Prototyping:** FDM 3D printing, electronics, KiCAD basics
- **Biological Testing:** MTT cell biocompatibility, bacterial disk diffusion assays
- **Materials characterisation:** FTIR, DSC, XRD, UV-Vis, TGA, SDS-Page, Vickers hardness testing, SEM and optical microscopy
- **Mechanical tests:** Tensile, strain gauge, vibration/hammer testing
- **Programming:** (with LLM help) MATLAB, Python, HTML, CSS, Javascript, Arduino microcontroller control, excel data analysis

AWARDS & CERTIFICATIONS

- **Royal Commission for 1851 Industrial Design Studentship**
- **Royal Academy of Engineering Leaders Scholarship**
- Bright Network "breaking barriers" finalist
- Sheffield Engineering Leadership and Service Award
- IEMA Green Impact Auditor Certification
- International Nickel award for top of matsci cohort

EDUCATION

Innovation Design Engineering MSc/MA

Imperial/Royal College of Art (2025 - 2027)

Double masters course, A programme for fiercely curious changemakers

- Designed an interface for children's first introduction to AI
- Created a working "snake" continuum robot, to dance only when good quality recorder playing is heard

Materials Science and Engineering BEng with a Year In Industry

1st class Hons (4.0GPA), top of cohort

University of Sheffield (2021 - 2025)

Modules include: Microfabrication | Functional materials | Mathematics | Biomaterials | Biochemistry | Characterisation | Microstructure, Deformation, Fracture | Materials Processing & Manufacture

A levels + GCSE (2016 - 2020, Rolls-Royce Young Apprenticeship + Allestree Woodlands School)

Maths. Physics, Chemistry, 9 GCSEs, Rolls-Royce 1st Certificate and NVQ

RESEARCH EXPERIENCE

Novel liquid crystal elastomer muscles from highly conjugated compounds
(2023 - 2024 dissertation - awarded 1st class grade)

Supervisor: Dr Xiangbing Zeng (published in crystal growth & design: "Mesomorphic behaviour of novel photopolymerisable carbazole liquid crystals and photo-curing for 4D printing")

- Self proposed final year project: characterisation and fabrication of synthetic muscle fibres with novel liquid crystal elastomer compounds
- XRD (Diamond Light Source), DSC, Polarised Optical Microscopy analysis
- Attempting fibre pulling with UV light crosslinking - aiming for monodomain alignment to achieve actuative properties
- Characterised properties of novel liquid crystal elastomer materials, useful for soft sensors and microscale acutators
- Won prize for best undergraduate project poster

Mi casa Es-cupir: A characterisation of the spittlebug's foam home *(Summer 2023)*

Supervisor: Dr Chris Holland (publication tbc)

- Self directed project characterising structure and function of seldom studied Cercopoidae foam
- FTIR, DSC, TGA, SEM, UV-Vis, SDS PAGE electrophoresis, with wet chemistry, rebubbling test rigs, contact angle, and disk diffusion bacterial assay
- Found novel variation of properties based on host plants
- Dissemenated to Leeds Student Sustainability Research Conference 2024

OTHER PAID EXPERIENCE

Set up and run e-commerce store (2020 - present)

- Pivoting quickly to capitalise on market trends
- Stringent quality standards (100% positive feedback), sales, copywriting, and negotiation skills when sourcing
- Created AI integrated automated lister to quickly list stock from just a photo. Currently developing into an app to be commercialised

Mentoring students from underepresented backgrounds (2023)

- Mentee quotes: "I feel recognised as an individual" | "Yeah I don't scroll on TikTok anymore, I revise in the library in my frees now" | "I actually understand logs now!"
- Developed and delivered bespoke subject specific tutoring, study skills, and university preparation

Theatre, TV and Film work (2015 - present)

- Creating critically acclaimed, professional quality youth theatre (Derby Theatre + SUTCo)
- Paid TV and film work