

# Dr Joshua Brown

## Education

### Queen Mary University of London

#### PhD, Robotics 2018 – 2023

- Developed interactive haptic interfaces for real-time robot operation in difficult environments
- Co-designer of a 3D printable face shield visor for COVID-19 protection, the second such product to gain medical certification in the UK. Over 3,000 of these visors were produced and used in London hospitals.
- Supported and formed collaborations between the Robotics Centre and Psychology and Medicine
- Co-founded a startup company, Human Robotix Ltd. to commercialize parts of my research
- Supervised/co-supervised 8 MSc, MEng and BSc project students (2 prize winning projects)
- Webmaster for the Centre for Advanced Robotics public website
- Awarded the Queen Mary Diploma of Researcher Development
- Funded by the EPSRC, IEEE and Queen Mary University of London

### Imperial College London

#### MEng, Electronic and Information Engineering, Upper Second-Class Honors *Conferred August 2018*

#### *Master's Project*

- Developed a fingertip tactile display to impart a tactile representation of printed text, shape and colour
- Awarded 85% mark and the Eric Laithwaite prize for outstanding innovation in an individual project
- Supervised by Emeritus Professor Robert Spence and Dr. Mark Witkowski

#### *Projects*

- Robotic walking aid; Smart coffee machine (*sponsored by IBM*); Single-camera 2D-3D video conversion

## Selected Publications

- **J. Brown**, F. Bello, "Design and Characterisation of Particle Jamming-Based Variable Stiffness Displays using Non-Pneumatic Actuators," IEEE Haptics Symposium, Long Beach, 2024. (Best paper honorable mention)
- **J. Brown**, I. Farkhatdinov, "Soft Haptic Interface based on Vibration and Particle Jamming," IEEE Haptics Symposium, Washington DC, 2020. (Best paper finalist)
- A. Ewan, H. Alani, **J. Brown**, "Dermaphone: Using Photogrammetry-based Data Driven Vibrotactile Texture Rendering to Simulate Skin Lesions for Dermatology Students using a Smartphone," EuroHaptics 2024, 2024.
- **J. Brown**, A. B. Clark, B. Omarali, "Design and Implementation of a Polar-type 3D Printer for Highly Optimised Manufacturing of Prosthetic Sockets in LMICs", Hamlyn Symposium on Medical Robotics (HSMR), London, 2024
- **J. Brown** and I. Farkhatdinov, "Shape-Changing Touch Pad based on Particle Jamming and Vibration," 2021 IEEE World Haptics Conf. WHC 2021, p. 337, 2021
- Full list available at <https://www.jb-robotics.com/publications> and [Google Scholar](#)

## Selected Funding (Total funding approx. £215,000)

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| • Imperial College-MIT Global Seed Fund, ~£35,000                                      | 2024 |
| • MRC UK-Korea Biomedical Partnering Award, UKRI, ~£100,000                            | 2023 |
| • Dame Julia Higgins Postdoctoral Collaboration Award, Imperial College London, £2,900 | 2023 |
| • Impact Acceleration Small Grant, Queen Mary University of London, £10,000            | 2022 |
| • Bart's and the London Charity Advancing Healthcare Grant, ~£50,000                   | 2021 |
| • Globalink UK-Canada Doctoral Exchange, UKRI & Mitacs, ~£12,000                       | 2020 |
| • Innovation in Haptics Student Grant, IEEE, \$2,500                                   | 2018 |

## Awards

Honorable mention for best paper, IEEE Haptics Symposium (2024); Engagement and Impact - Local Champion Award, QMUL (2021); Best paper nominee, IEEE Haptics Symposium (2020); Best poster, Materials Research Institute Christmas Symposium (2019); Imperial College Eric Laithwaite Prize (2018), Imperial College President's Scholarship (2014), Bloodhound SSC Award for Excellence in Engineering (2013), Advanced STEM Leaders Award (2013), Rolls-Royce Arkwright Engineering Scholarship (2012)

## Teaching

- Labs/tutorials: Skills for electronics engineering, Skills for robotics engineering, Robotics design and build project, Interaction design
- Supervision: 15 MEng, MSc, BSc and iBSc project students working on topics ranging from VR to biomaterials. 4 prize-winning students, 1 pursuing/pursued a related PhD

## Technical Skills

- Excellent MCAD and ECAD skills including Solidworks and Autodesk Fusion 360, Inventor and Eagle
- Wide experience of CNC manufacturing including 3D printing (FDM and SLA), laser cutting and machining
- Sound knowledge of programming in C/C++, Python, MATLAB, SQL and several RISC assembly languages
- Extensive experience using the ARM mbed, Arduino and Raspberry Pi embedded computing/control platforms

## Professional Activities

- Co-Chair, Imperial College Special Interest Group on Extended Reality (XR) in Education, 2023-present
- Co-organizer, "From virtual contact to clinical impact: exploring the role of touch in medicine and surgery" - a workshop to be presented at the Hamlyn Symposium on Medical Robotics 2024
- Chair, PhD Student Representatives Committee, QMUL EECS, 2020-2022
- PhD Student Representative, QMUL Robotics, 2019-2021
- Web Chair, TAROS 2019 conference
- Reviewer for ICRA 2020 & 2021, EuroHaptics 2020 & 2022, HAID 2022 and IEEE ToH and RA-L

## Positions Held

### **Haptics Research Associate – Department of Surgery and Cancer, Imperial College London (2023-present)**

- Research into haptic simulations of physical examinations for use in undergraduate clinical skills training

### **Co-founder & Director of Engineering – Human Robotix Ltd. (2021-present)**

- Start-up company specializing in robotics for biomechanics research and physiotherapy

### **Visiting Researcher – Department of Mechanical Engineering, Seoul National University (2024)**

- Conducted research into soft haptic interfaces for use in medical training and simulation

### **Visiting Researcher – Royal London Dental Hospital (2020-2023)**

- Research into applications of 3D printing for personalized PPE, surgical implants and dental reconstructions
- Designed a 3D printed maxillofacial implant that is now being used clinically

### **Teaching Assistant – Various departments, Queen Mary University of London (2019-2023)**

- Assisting in teaching electronics/robotics labs, design and build projects and human-computer interaction

### **Visiting Researcher – Electronic Engineering and Computer Science, York University, Canada (2022)**

- Research into haptic feedback for hazard awareness/avoidance in underwater robot teleoperation

### **Research Assistant – Department of Bioengineering, Imperial College London (2020-2021)**

- Designed, prototyped and marketed a portable, back-drivable haptic interface for wrist manipulation

### **Research Assistant – Various departments, Queen Mary University of London (2019-2020)**

- Conducted research in the fields of haptics, mechatronics, animal-robot interaction and agricultural robotics