

- Rapid prototyping
- Schematic capture and PCB design in Altium
- Firmware and software development
- CAD with Autodesk Inventor, confident with laser cutting and 3D printing
- Troubleshooting complex systems, expertise in bare-metal, digital electronics, physical design, and systems engineering
- Design for manufacture, management of outsourced manufacturing
- Lab management and organisation
- Hardware testing, characterisation, and validation

## **Relevant work experience**

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2020-2023     Research Engineer - [MSD Group](#) at University College London, London

As the primary hardware developer for the "[OpenMPD Particle Based Display](#)," a research project which has spun-out into [AcoustoFab](#), I assumed responsibility for all aspects of electronics design, mechanical CAD, assembly, fabrication, and testing. Additionally, I managed the distribution of over 100 boards internationally and oversaw the assembly process, which I outsourced. [We partnered with UIST 2022](#) who utilised our OpenMPD platform and hardware for their student innovation contest.

I lead authored "[Two Gimbal PAT: An artistic installation combining mechanical and acoustic rotation of levitated content](#)" CHI 2022, and co-authored "[Actively Reconfigurable Segmented Spatial Sound Modulators](#)" Advanced Materials Technologies 2023.

I played a key role in managing the lab space, and supervised its growth by providing technical support to over 20 Post Doc researchers and PhD students addressing a wide range of technical requirements.

2018-2020     Research Technician - Interact Lab at University of Sussex, Brighton

I contributed towards the growth and management of a multi-disciplinary HCI lab focusing on cutting-edge research in [holograms](#), [multimodal levitation](#), [wearable technologies](#), [programmable liquid matter](#), [metamaterials](#), and [adaptive shape changing screens](#). My technical objectives included facilitating the achievement of research and production goals by enabling lab members through rapid prototyping of electronic designs. Additionally, I developed cross-platform software using Python, C#, and Java to interface with hardware written in C.

I was responsible for the full lifecycle design of the revised levitation and Acoustophoretic board. The state-of-the-art board was designed in Altium and controlled by an FPGA, housing 256 uniquely controllable ultrasound speakers on two six-layer high-speed PCBs. This board has been integral to several published academic papers, including prestigious publications in [Nature journal](#) where my contribution was acknowledged in [Appl. Phys. Lett. 115, 064101](#).

2015-2018     Developmental engineer - [Bitvu Ltd](#), Brighton

I engineered a [a multi-channel, multi-protocol streaming encoder](#) that supports legacy analogue signals while also utilizing a novel design that reduced the cost by 80% compared to competing products. The initial contract involved interfacing an audio source to a Broadcom SoC and controlling an HDMI-to-CSI IC. As the primary project engineer, my responsibilities included designing and implementing the system architecture, creating schematics, and reviewing and supervising overseas PCB layout engineers. I collaborated with the Raspberry Pi foundation on a branch of their kernel driver to develop support for the Toshiba TC358743.

## Relevant technical skills

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- Hardware** I possess professional experience in PCB design using Altium, with a focus on design for manufacturability (DfM) considerations. Additionally, I excel in assembly, playing a vital role in the production process. My expertise extends to various communication protocols, including Bluetooth, 802.11, RS232, USB, I2C, I2S, and HDMI. I am adept at troubleshooting hardware issues and possess proficiency in reverse engineering undocumented hardware. Notably, I have designed analogue audio systems, such as the development of a low-noise Raspberry Pi sound card 'Hat,' showcasing my ability to deliver high-quality solutions.
- Software** Proficient in: C, C#, and Java. Some experience with: Python, C++, and BASH. Studied: Haskell, Prolog, Pascal, MATLAB, LabView, SQL, VHDL, and MIPS.
- Management** I have successfully managed offshore engineers and outsourced manufacturers for large projects. I find these challenges rewarding and eagerly anticipate the opportunity to further develop my managerial skills.

## Education and awards

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- 2011-2015 First class BEng with Honours in computer engineering, University of Sussex
- Designed and engineered a full-stack solution for a Galaxy S4 case that incorporated multi-touch pressure and positional input data using sensors on the sides and rear surfaces of the phone.
  - Developed the [PCB](#), firmware, and android app to showcase new modes of interaction with the device.
    - 2015 Rohde & Schwarz Project Prize Award
    - 2015 IET Gerald David Memorial prize Nominee
    - 2014 Best Engineering student awarded by Eurotherm by Schneider Electric
- 2007-2009 A-Levels in electronics, computing, and music technology - Sussex Downs College, Lewes
- 2005-2006 BTEC certificate in contemporary music - Brighton Institute of Modern Music, Brighton

## Other notable experiences

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Emerging leaders – University College London, London. Awarded August 2022  
Completed a comprehensive five-month leadership development course.

[Learning to lead](#) programme – University of Sussex, Brighton. Awarded June 2011

Language teacher – Shijie Chinese-English School, Hunan, China. August – September 2006  
I created and delivered lesson plans and organized events to foster cross-cultural understanding among students aged 7 to 19.

## Personal interests and projects

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- I developed an [Android case](#) enabling full OS control without touchscreen interaction, utilising BLE 4.0 or USB OTG.
- [Noiseless four-layer line-in and microphone pre-amplifier sound card](#) "HAT" for Raspberry Pi, using I2S.
- [BLE MIDI foot pedal](#) controller for the Yamaha THR30ii Guitar amp.
- [Standalone BLE and USB Thinkpad keyboard and mouse](#) open-source project engineering Bluetooth controller and case .
- [Autonomous audio and power IO selector board](#) with SPDIF DAC, controlled by IR/WiFi/BLE.
- A reactive baby light designed to gauge the child's state of calmness and aid sleep,
  - Android monitor and control application, with hardware and firmware interfaced through Bluetooth.
- Produced bespoke electronics for a themed escape room at Escape Kent in 2017.
- Contributed towards the open-source development of Adafruit's DRV2605 Haptic Controller Board.
- Co-authored Arduino workshops for SheCodes organization.
- Native English speaker with a competent spoken understanding of Farsi