QINGYU ZHANG

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SUMMARY

Qingyu began his PhD in March 2024 in the Department of Electronic and Electrical Engineering at University College London (UCL). **From the very beginning of his PhD, he is expected to produce up to five publications. He graduated as the top student in his MSc program**, receiving a distinction at the University of Bristol (UoB), where he also served as the Student Rep for his class. In recognition of his high achievement, he was awarded the China Scholarship Council (CSC) scholarship at UoB. Prior to his UK study, Qingyu had two years of industrial experience at the R&D department of two high-tech companies in Beijing, working as an Internet of Things (IoT) engineer and then as a project manager. **He is the co-inventor of 6 patents** and was awarded the Outstanding Employee of the Quarter in 2021. Huazhong University of Science and Technology (HUST) is one of the very top universities in China, where he received his BEng degree along with multiple scholarships, e.g. 'Scientific and Technological Innovation Scholarship' and awards, e.g., 'Outstanding Graduate of HUST'. In addition, he led a team in the 'Science and Technology Innovation for Chinese University Students competition' and **won second place at the provincial level**. Guided by his passion for EEE, Qingyu has been running a number of open-source projects on [GitHub](#) and [Notion](#) and is a technical blogger on the Chinese Software Developer Network (his [CSDN](#)) with articles with over 6000 views.

EDUCATION

MPhil/PhD in Electronic and Electrical Engineering, UCL	**Mar 2023 – Now**
MSc in Advanced Microelectronic System Engineering (AMSE), **UoB**	**Sep 2022 - Sep 2023**

- Degree Class: **Distinction** (1st place in the class of years 22-23, overall score 83/100)
- Final project mark: 88/100
- Student representative of AMSE

BEng in Optical Electronic Information Engineering, **HUST**	**Sep 2016 - Jul 2020**

- Overall grade: GPA 3.22/4
- Final project mark: 88/100

WORK EXPERIENCE

IoT Manager, **New Oriental Education Technology Group (XDF), Beijing, China**	**Feb 2021 - Dec 2021**

- Led a team of three IoT engineer colleagues.
- Developed a full-stack controller based on the ESP32 chip, featuring '*develop once, and adapt everywhere.*' for smart classroom applications.
- **Key innovation:** Optimised deep learning models for face recognition using sub-model networks and model distillation methods. Our model is over 50% smaller and has inferred speed up to 20% faster advantages over other open-source models at the time.
- Over 200 prototypes were produced when I left the company.

IoT Engineer, **Shensi Shudun Technology, Co, Ltd, Beijing, China**	**Jul 2020 - Jan 2021**

- In charge of developing five Windows desktop applications for streamlining the assembly production line.
- In charge of developing a smart dock that enhances the functionality of existing air purifiers.
- **Key innovation:** Re-structured the hardware communication process on the M263KI chip and successfully expanded SPI communication to 6 serial channels, significantly enhancing efficiency compared to the existing four-channel scheme.
- The smart dock is mass-produced at 1000+ units per year.

PUBLICATIONS

Conferences Paper:
- Jiayang Li, **Qingyu Zhang,** Dai Jiang, Sohmyung Ha, Andreas Demosthenous, and Yu Wu, "A 0.62 µW/sensor 82 fps Time-to-Digital Impedance Measurement IC with Unified Excitation/Readout Front-end for Large-Scale Piezo-Resistive Sensor Array," submitted to IEEE International Solid-State Circuits Conference (ISSCC), 2026.
- **Q. Zhang**, A. Al-Hindawi, A. Demosthenous, and Y. Wu, "Haptic enhanced bioimpedance needle for precision navigation in central venous catheterisation with millimetre accuracy," submitted to *2025 IEEE Int. Symp. Circuits Syst.*
- J. Chi, **Q. Zhang**, Z. Zhang, A. Demosthenous, and Y. Wu "High Resolution Plantar Pressure Insole System for Enhanced Lower Body Biomechanical Analysis," submitted to 2025 IEEE Int. Symp. Circuits Syst.
- J. Zhang, **Q. Zhang**, Y. Wu, D. Jiang and A. Demosthenous "A Method for Improving the Wearability of Capsule Positioning System Using Particle Filter," submitted to 2025 IEEE Int. Symp. Circuits Syst.
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Live Demo Paper:
- **Q. Zhang**, A. Al-Hindawi, A. Demosthenous, and Y. Wu, "Live Demonstration: Haptic-Enhanced Bioimpedance Needle for Assisting Central Venous Catheterisation," submitted to *2025 IEEE Int. Symp. Circuits Syst.*
- J. Chi, **Q. Zhang**, Z. Zhang, A. Demosthenous, and Y. Wu, "Live Demonstration: A High-Resolution Plantar Insole System for Lower Body Estimation," submitted to *2025 IEEE Int. Symp. Circuits Syst.*

PATENTS

Those are generated from the R&D projects to which I made key contributions.

- 'Image processing method and apparatus, electronic device and computer-readable storage medium', CN115393922A, 2022
- 'Data processing methods, apparatus, storage media and electronic devices', CN114969790A, 2022
- 'Attitude recognition method, apparatus, storage medium and electronic device', CN114782994A, 2022
- 'Sitting posture recognition method, device and storage medium', CN114821652A, 2022
- 'Face recognition method, apparatus, storage medium and electronic device', CN114998955A, 2022
- 'Image processing method, apparatus, storage medium and electronic device', CN114913181A, 2022

AWARDS

- Best live demo, ISCAS, 2025
- Outstanding Employee of the Quarter in 2021, top 1.5% of 200 colleagues in the AI research institute of XDF
- Outstanding graduate from HUST in BEng and BA college in 2020
- Academic Progress Scholarship in HUST in 2019
- Outstanding Student Cadres Scholarship in HUST in 2018 and 2019
- Scientific and Technological Innovation Scholarship in HUST in 2018
- Third prize in the Mathematical Modelling Competition in central China in 2018, the top 5% of 2000 groups
- Second prize at HUST Entrepreneur Camp in 2018, second out of 26 teams

RESEARCH SKILLS

- Proficient in programming languages **C/C++, Java, Python, Matlab** with expertise in developing and testing various software solutions for research-oriented applications.
- Extensive hardware engineering experience, including the design and verification of various PCB circuit systems tailored for diverse applications, such as power management, and embedded system integration. Proficient in **circuits schematic design**, **layout optimisation**, and **hardware debugging** to ensure reliability and performance across different use cases.
- Strong cross-platform development capabilities, including **Linux**, **embedded RTOS**, and **Android**.
- Proficient in SolidWorks, Blender, and COMSOL for 3D modelling and simulation, with specialized experience in **co-simulating electrical properties**—particularly electric field analysis for bioimpedance.
- **Paper writing experience** showcasing groundbreaking research results, presented at the prestigious ISCAS 2025 electronics conference.

RESEARCH EXPERIENCE

Research assistant: Developing the smart insole related hardware and software system **Mar 2025 – Sep 2025**
Research assistant: Developing the ultra-low power embedded system for in vivo stimulation **Oct 2024 – Apr 2025**
PhD research: Prototype bioimpedance needle for central venous catheterisation with haptic assistance **May 2024 - Oct 2024**
- Performed bioimpedance needle structure analysis using COMSOL.
- Developed a complete application system integrating an embedded Bluetooth module, a haptic robot, and a user interface.
- **Key result:** In 24 user-participation trials on a phantom model, the system achieved a 100% success rate for venous entry, with a root mean square error of 0.66 mm and an 87% probability of positioning within ±1 mm of the vein centre. This system has been evaluated by NHS colleagues for medical needle navigation.

Final year project: design and modelling of power conditioning circuits for triboelectric nanogenerator **May 2023 - Sep 2023**
- Used COMSOL for finite element analysis to model and analyse a triboelectric nanogenerator (TENG).
- Used Verilog-AMS in Cadence to design an analytical TENG model.
- Based on TENG models to design a reliable and efficient power management circuit for the bladder actuator.
- **Key result:** the system can generate 3.25 mAh of electricity daily with an efficiency of 23%, which is higher than most designs.

Final year project: design and optimisation of geomagnetic algorithm based on DSP **Feb 2020 - Jun 2020**
- Optimise the World Magnetic Model 2020 (WMM2020) algorithm.
- Implement this algorithm on a DSP platform and focus on hardware performance improvement.
- **Key result:** achieved relative error of less than 0.003% and improved calculation speed to approximately 0.57ms, which is twice the performance of existing systems at the time.

Research Assistant at China National Photovoltaic Laboratory **Oct 2019 - Jan 2020**
- The project aims to measure blood flow rate and oxygen level by laser scattering imaging, funded by HUAWEI.
- In charge of setting the camera and laser experimental platform.
- In charge of optimising the laser scatter imaging algorithms.
- **Key results:** generated a thermal map to indicate the organism's blood flow rate and a monitoring curve of blood oxygen over time. Compared to other methods, these results allow blood flow rate and oxygen level to be obtained by standard mobile phones.

Innovative project: High Precision Liquid Surface Measurement **Apr 2018 - Dec 2018**
- Used TracePro to analyse the laser distribution on the liquid's surface from a light source emanating from the bottom glass tube.
- Designed hardware devices and software systems to measure laser intensity on liquid surfaces by 3D printing and Python.
- **Key results:** liquid height measurement error between 0.5 mm and 1.2 mm. This is a highly accurate measurement of the height of different chemical liquids.