Junjian Chi

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Education

MRes in Sensor Technologies and Applications, University of Cambridge — 2025 – 2026
Advisor: Dr. Elliott Wu — *Cambridge, UK*
Thesis: Real-to-Sim-to-Real Transfer with High Physical Fidelity for RL Manipulation Policy Learning

BEng in Electrical and Electronic Engineering, University College London — 2022 – 2025
Grade: First-Class Honours — *London, UK*

Publications

[1] **J. Chi**, Z. Zhang, Q. Zhang, A. Demosthenous, and Y. Wu, "Multimodal Smart Insole with Crossbar Crosstalk Compensation for Fall-Risk Prediction," in IEEE Int. Symp. Circuits Syst. (ISCAS), 2026. (Poster)

[2] **J. Chi**, Q. Zhang, Z. Zhang, A. Demosthenous, and Y. Wu, "High-Resolution Plantar Pressure Insole System for Enhanced Lower Body Biomechanical Analysis," in IEEE Int. Symp. Circuits Syst. (ISCAS), 2025. (Lecture)

[3] **J. Chi**, Q. Zhang, Z. Zhang, A. Demosthenous, and Y. Wu, "Live Demonstration: A High-Resolution Plantar Insole System for Lower Body Estimation," in IEEE Int. Symp. Circuits Syst. (ISCAS), 2025. (Poster)

Research Experience

Google DeepMind Research Ready Internship — Jun. 2025 – Jul. 2025
Project: ML-driven Analysis of Skyrmion Dynamics for Neuromorphic Computing — *University of Edinburgh, UK*
- Simulated Y-junction nanotrack and performed multi-physics sweeps in COMSOL to analyse skyrmion dynamics.
- Trained a neural surrogate model with Bayesian optimization to predict viable configs from limited 2k simulations.

Rosetrees Funded Research Assistant — Oct. 2024 – Jul. 2025
Project: Multi-sensor-based 3D Human Pose Estimation for Lower-body Rehabilitation — *University College London, UK*
- Reconstructed physically plausible 3D body pose with differentiable optimization to suppress MediaPipe noise.
- Proposed a CNN + Transformer for 3D body reconstruction via SMPL regression from plantar pressure and IMU.

Qualcomm Funded Summer Internship — Aug. 2024 – Sep. 2024
Project: High-density Tactile Sensing System for Biomechanical Feedback — *University College London, UK*
- Designed a flexible PCB with 253 pressure sensors and analogue front end for real-time contact force mapping.
- Implemented FreeRTOS on ESP32 for sensor array DMA readout and wireless data streaming at 60+ Hz.

UROP Research Assistant — Jun. 2024 – Aug. 2024
Project: Wearable Multi-sensor Sleeve for Robotic Prosthesis Control — *Imperial College London, UK*
- Modeled and fabricated a wearable silicon armband with Fusion 360 integrating EMG and ultrasound sensors.
- Developed an embedded control system to drive robotic hand based on real-time 16-channel EMG signals.

Projects & Competitions

3D Gaussian Splatting for Robot Sim | *Cambridge MRes* — Mar. 2026 – Present
- Reconstructed real-world scenes via 3D Gaussian Splatting and exported as USD assets into Isaac Sim.
- Trained grasping policies in reconstructed environments with domain randomization for sim-to-real transfer.

Zero-Shot Object Pose Estimation on Edge Device | *Cambridge MRes* — Feb. 2026 – Present
- Compressed YOLOv8 to INT8 via TensorRT for real-time object detection at 60+ FPS on Jetson Orin Nano.
- Deployed MegaPose for zero-shot 6-DoF pose estimation from reference images without CAD models.

IEEE CASS Student Design Competition – 1st Place | *Team Leader* — Dec. 2023 – Mar. 2024
- Built a physics simulation in Unity with IMU to model biosensor-pill trajectory in the gastrointestinal tract.

Technical Skills

Programming Languages: Python, C, C++, System Verilog, MATLAB
ML/Robotics: PyTorch, CUDA, TensorRT, ROS, Isaac Sim, OpenCV
CAD/Simulation: Altium Designer, COMSOL, Fusion 360, Unity, Blender
Hardware/Embedded: ESP32, STM32, Jetson, FPGA, FreeRTOS, Soldering
Tools: Git, Linux, Docker, Shell, 3D Printing