



# Jiakun Yu

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🏛️ The University of Sydney 🎓 Computer Science •HCI •PhD 🎓 1995-03

I obtained my **PhD** in 2024 from the University of Sydney, where I specialized in Human-Computer Interaction and Soft Devices under the supervision of **Dr. Anusha Withana** and **Prof. Judy Kay**. I have published in two top-tier journals within these disciplines and led five interdisciplinary projects. I look forward to collaborating with a team in the fields of digital fabrication and wearable sensors to create impactful technologies.

## 🎓 Education

**2020.07 – 2024.09**      **The University of Sydney**      **Human-Computer Interaction (PhD)**

**Supervisor:** Dr. Anusha Withana

**Thesis:** Computational Design and Fabrication of Customizable Interactive Soft Devices

**Projects:** I led three novel projects during my PhD, focusing on smart textiles, customizable pressure sensors, and epidermal sensors. Additionally, as a core team member, I contributed to the development of devices that assist visually impaired people in perceiving graphics.

**2019.01 – 2019.12**      **The University of Sydney**      **Data Science (Master)**

**Supervisor:** Dr. Anusha Withana

**Major:** Machine learning, statistical principles, cloud computing, data mining, data visualization, etc.

**Project:** Design and manufacture a flexible bending sensor that can detect and record the degree of bending of the user's body joints, and provide real-time feedback and suggestions to the user based on the collected data.

**2014.01 – 2018.12**      **Monash University**      **Electrical and Computer System (Honors)**

**Supervisor:** A/Prof. Yi Hong

**Major:** Theoretical and practical learning in multiple areas such as computer systems, electronics, electrical engineering, robotics, and telecommunications.

**Project:** Simulations reproduced the application of polar code encoders and decoders in 5G wireless communications, mathematically verifying the advantages of polar code.

## 💻 Research

**Project 1:** Using Ironable 3D Printed Objects to Fabricate and Prototype Customizable Interactive Textiles

- As the first author, I applied the thermoplastic properties of 3D printing materials to fabrics, transforming traditional textiles into smart clothing using diverse material characteristics.
- Showcased various novel smart textile applications, such as conductive sensing, circuit tracings, and photo-sensitive features, demonstrating their effectiveness and practicality.
- Developed a Kirigami-like structure to improve the designs' flexibility and wearability.
- Conducted comprehensive evaluations of durability, fabric compatibility, and ideal ironing parameters to ensure the technology's practicality and reliability.

**Results:** It has been published in **UbiComp / IMWUT**, which is a flagship conference in HCI (**CCF-A, CORE A\***).

**Project 2:** Fabricating Customizable 3-D Printed Pressure Sensors by Tuning Infill Characteristics

- As the first author, I utilized 3D printing technology to develop customizable pressure sensors and studied the impact of infill parameters on their performance.
- Used Hall sensors to detect changes in magnetic fields caused by pressure, measuring the displacement of embedded magnets for precise pressure measurement.
- Applied finite element simulation to analyze how different infill affect sensor flexibility and sensitivity, optimizing design parameters.
- Successfully enhanced traditional products like coasters, wristbands, and insoles with smart technology, significantly improving their interactive experience and functionality.

**Results:** This research has been published in the **IEEE Sensor Journal**, a top journal in the sensing area (**JCR Q1**). Additionally, it has been demonstrated at the **Augmented Humans Conference**.

### **Project 3: Design and Development of Ultra-Thin Bending Sensors**

- As the first author, I developed a sensor made of silicone only 0.9mm thick, designed to measure deformations in human joints such as fingers, elbows, and knees.
- Designed a series of novel conductive tracings that enhanced the measurement dimensions and accuracy of the epidermal bending sensors, providing new technical solutions for wearable medical devices.
- Conducted theoretical analysis and design optimization through finite element analysis. Additionally, verified the actual product performance using evaluation setups.

**Results:** This research has been published in the **IEEE Sensor Journal**.

### **Project 4: Designing Vibration Feedback Devices for the Visually Impaired People**

- As the second author, I participated in designing a vibration feedback device intended to help visually impaired individuals perceive graphics on touchscreens through tactile feedback.
- The device adjusts the vibration frequency, amplitude, and direction of embedded motors to assist visually impaired individuals in recognizing shapes and patterns.

**Results:** It has been published in *Interactive Surfaces and Spaces (ISS)*, which is rated as **CCF-B** and **CORE A**.

## **Work Experience**

**2025.03 – Present**

**Purdue University**

**Postdoctoral Research Associate**

**Project:** Adaptive Wearable Coach for Personalized Physical Training

**Description:** Conducting research on adaptive wearable systems for motor skill learning, integrating sensing, feedback, and personalization strategies to enhance user performance and engagement. Collaborating across HCI, sports science, and wearable technology disciplines.

**2021.06 – 2023.06**

**The University of Sydney, University of New South Wales**

**Teaching Assistant**

Served as a Teaching Assistant for DATA2001/2901 (Data Science, Big Data and Data Variety), COMP5047 (Pervasive Computing), and ZEIT8018 (Cyber Resilience: Management Governance and Acquisition). Responsibilities included assisting with teaching, grading exams, facilitating class discussions, and leading lab sessions.

**2019.05 – 2019.07**

**Hunan Xiaoben Sports Technology Co., Ltd**

**Algorithm Engineer**

**Visual Optimization:** Developed the body movement recognition feature for the “Xiaoben Sports” app, using computer vision to automatically capture and count jumping jacks via smartphone cameras. Optimized the CVzone package to ensure precise marking of human keypoints for accurate motion detection.

**Outcome:** Enabled the smartphone camera to easily record users’ activity counts, enhancing the exercise experience and effectively motivating users.

**2018.12 – 2019.02**

**Changan Automobile Co., Ltd.**

**Automotive Engineering Intern**

**Sensor Calibration:** Calibrated and optimized the LiDAR sensors’ API for Changan’s autonomous vehicles, using C++, Python, and other tools to ensure data accuracy and timeliness.

**Environmental Reconstruction:** Implemented SLAM for autonomous driving on the ROS platform using Google Cartographer, optimizing map generation algorithms and sensor integration strategies to improve system localization accuracy and map update rates.

## **Skills and Awards**

**Language Proficiency:** English – Professional level **Professional Skills:** Proficient in multiple programming languages including Python, C, R, and MATLAB; skilled in digital fabrication tools like 3D printing and laser cutting; familiar with 3D modeling and interaction software such as Rhino, Fusion 360, and Unity; experienced in finite element analysis tools like COMSOL and ANSYS.

### **Honors and Awards:**

- 2020 – 2023      Engineering Research Scholarship (ERS), The University of Sydney.
- 2019                 Summer Research Project Scholarship, The University of Sydney.

### **Interests and Hobbies:**

- Soccer enthusiast: Primarily plays as a left forward in the team.
- Skiing skills: Holds instructor-level proficiency in both snowboarding and skiing.
- Marathon experience: Completed the 2018 Melbourne Marathon.