

Taiting (Jackson) Lu

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- Education**
- Pennsylvania State University** **State College, PA**
Ph.D. in Computer Science Aug. 2021 - Present
- University of California, Irvine** **Irvine, CA**
B.Sc. in Computer Science Jun. 2016 – Jun. 2021
B.Sc. in Electrical Engineering
- Research**
- IoT and human behavioral sensing
 - Wearable & Mobile Healthcare
 - Machine Learning application
 - Mobile and Wearable Computing
- Publication**
- I am an Earphone and I can Hear my Users Face: 3D Facial Reconstruction using Smart Earphones
Taiting Lu*, Shijia Zhang*, Hao Zhou, Yilin Liu, Runze Liu, Mahanth Gowda
ACM Transactions on Internet of Thing, 2023
 - SignQuery: A Natural User Interface and Search Engine for Sign Language with Wearable Sensors
Hao Zhou, **Taiting Lu**, Kristina McKinnie, Joseph Palagano, Kenneth DeHaan, Mahanth Gowda
ACM MobiCom, 2023
 - One Ring to Rule Them All: An Open Source Smartring Platform for Finger Motion Analytics and Healthcare Applications
Taiting Lu*, Hao Zhou*, Yilin Liu, Shijia Zhang, Runze Liu, Mahanth Gowda
ACM / IEEE IoTDI, 2023, Best Paper Award for IoT Edge AI
 - Learning on the Rings: Self-Supervised 3D Finger Motion Tracking using Wearable Sensors
Taiting Lu*, Hao Zhou*, Yilin Liu, Shijia Zhang, Mahanth Gowda
ACM IMUWUT/UbiComp, 2022
 - Storage codes with flexible number of nodes
Weiqi Li, Zhiying Wang, **Taiting Lu**, and Hamid Jafarkhani
IEEE Transactions on Information Theory, 2022
 - Flexible Partial MDS codes
Weiqi Li, **Taiting Lu**, Zhiying Wang, and Hamid Jafarkhani
Non-Volatile Memories Workshop/NVMW, 2021
- Experience**
- PSU IoT Research Group**, Penn State Department of Computer Science and Engineering **State College, PA**
Research Assistant; Advisor: Dr. Mahanth Gowda Aug. 2021 – Present
- Smartring Platform**
- Designed a lightweight, waterproof and comfortable ring that can be worn throughout the day and night while being embedded with electronics and sensors that can sense the users activity, heart rate, etc and stream the data wirelessly for analytics.
 - Exploited opportunities in SoC, flexible PCB, 3D printing and low-cost manufacturing to design, develop and manufacture a smartring with low cost of \$24.18, weight of 2.5 and up to a week of battery life.
 - Collaborated with teammate to integrate machine learning model in mobile phone and achieved low power consumption.
 - Designed circuits of smartring using NRF52832 as microcontroller, (Inertial Measurement Unit) IMU sensor, (Photoplethysmography) PPG sensor and power management integrated circuits (IC)
 - Mentored an undergraduate student to design and implement APPs for Android and iOS mobile phone.
- Earphone Platform**
- Designed an earphone platform embedded with acoustic sensors with a form-factor that is comfortable for wearing.
 - Implemented and experimented across diverse users to demonstrate the feasibility and robustness.
- Self-Supervised 3D Finger Motion Tracking Using Wearable Sensors**

- Designed a wearable platform using a two-layer printed circuit board (PCB) to minimize the footprint and uses a combination of Polylactic acid (PLA) and Thermoplastic polyurethane (TPU) as housing materials for sturdiness and flexibility. It incorporates a system-on-chip (SoC) microcontroller with integrated WiFi/Bluetooth Low Energy (BLE) modules for real-time wireless communication, portability, and ubiquity
- Designed different IMUs breakout for fingers and wrist using 9DoF IMU as sensor, ESP32-Pico-D4 as microcontroller and TCA9548A as multiplexer to collect sensor data and stream it to mobile phone WiFi/Bluetooth.

Karpos Cultivation LLC

Irvine, CA

Operation Lead; CEO: Frank Lee

Oct. 2020 - Present

- Served as an operation lead to manage a group of several teams including software team, hardware team, machine learning team and supply chain team to design, develop and manufacture a smart planting machine.
- Collaborated with hardware team to design and develop a smart indoor planting machine to plant mushroom, lettuce and herbs within a control loop system including sensing module like temperature sensor, humidity sensor and water sensor, controller module like light and pump and microcontroller module enabling WiFi communication.
- Collaborated with software team to design and develop a mobile APP to communicate and control smart planting machine to control lightness of light, temperature, and humidity inside the machine, developed a supply chain management website to manage flow of goods and planting machine.
- Led a team to manage supply chain in China to manufacture and exporting planting machine internationally.

Healthcare IoT Research Group, UCI Department of Information and Computer Science

Irvine, CA

Undergraduate Researcher; Advisor: Dr. Hadar Ziv, Dr. Dante, Dr. Walt Scacchi

Dec. 2019 – June 2021

Implementation of Edge Computing in Patient Monitoring System

- Collaborated with professors to develop a biometric data collection system which acquires and analyzes the patient's heart rate (HR) and saturation rate data in real-time, thus supporting efforts to improve medical care. Improved app user experience and accessibility by rigorously conducting cognitive walkthrough and on-site usability testing at UCI Medical Center
- Designed an edge computing system that, integrated three IoT systems, including biometric data collection system, indoor positioning system and social integrating system, via Raspberry Pi's, Tinypico, RSSI, RFID, Redis Pub/Sub, socket.io, Node.js, and MongoDB
- Designed edge computing architecture, composed of Edge layer, Fog layer, Cloud layer and Client layer, to collect data from edge devices, to apply machine learning (SVM and Decision Tree) to analyze users' data
- Designed a network diagram to transmit data from edge devices to mobile devices (client layer) and to control the edge devices through mobile devices
- Managed approximately \$600 in team funds and won \$750 from UCI summer undergraduate research program (SURP) 2020 in support of the team's research project
- Led an 8-person team in research and entrepreneurial efforts, with outcomes presented at multiple contexts including UCI Undergraduate Research Symposium 2021

Fellowship & Awards

NSF National I-Corps Program 2023

NSF Regional I-Corps Program 2023

2020 Chancellor's Award for Excellence in Undergraduate Research (2021) (One student per school per year)

UCI UROP Fellow (2019-2021)

UCI SURP Fellow (Summer 2020)

UCI Honorary SURP Fellowship (Summer 2019)

Skills

Computer: Microsoft Word, Excel, PowerPoint, Java, Python, C++, C, Swift, basic HTML, SQL, Firebase, OpenMpi, OpenCV,

Hardware: Keil MDK, nRFgo Studio, Arduino, Raspberry Pi, ESP32, RFID, Eagle, P Spice, OrCAD, SolidWorks, MATLAB, Altium

Language: Native in mandarin Chinese and Cantonese; Fluent in English