Jinxiu Liu

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EDUCATION

Wuhan University, ***Wuhan, China*** Sep. 2022 –Jun. 2026 (Expected)
B.S. in Intelligent Manufacturing Engineering, Hongyi Honor College **GPA:** 3.78/4.0
Selected Courses: Introduction to AI (100), Advanced Programming Language (95), Data Structure (99), Principles and Interface Technique of Microcomputer (90), Big Data Analysis & Processing (97), Robotics (92), Design and Manufacture (94), Engineering Mechanics (96), Circuit Analysis (96), Discrete Mathematics (91)

PUBLICATION & PATENTS

[1] X. Fan, **J. Liu (co-first author)**, H. Sun, J. Gao, J. Xu, J. Huang, K. Liu*, Ultra-thin Hydrogel E-skin with High Resolution for Thermal and Tactile Haptics, ***IEEE Sensors Journal***, 25(2025), pp.29680-29687.
[2] L. Chen, J. Liu, J. Shang, **J. Liu**, Z. Zhang, D. Wang*, Y. Zhao*, Zn/Cu Co-Deposition Enables Dynamic Interfacial Reconstruction for Stable Zinc-Metal Batteries, ***Advanced Functional Materials***, 1(2025), e16803.
[3] T. Zhou, **J. Liu**, C. Huang, K. Liu, Y. Li*, Architecting three-dimensional reconfigurable matter from programmably multi-stable pop-up kirigami. (***Science Advances***, in revision).
[4] X. Fan, **J. Liu (co-first author)**, J. Xu, K. Liu*, J. Huang*, A Low Voltage-powered Flexible Electro-osmotic Actuator for Wearable Haptics. (**Biosensors and Bioelectronics**, submitted, Nov. 15).
[5] **J. Liu (co-inventor)**, Wuhan University. A Low-Voltage Controlled Electro-osmotic Actuator and Tactile Feedback Array. Chinese Patent Publication No. CN120386471A, published, Jul. 29, 2025.

RESEARCH EXPERIENCE

GEORGIA INSTITUTE OF TECHNOLOGY, ***Atlanta, GA (Onsite & Remote)***
Flavin Neuromachines Lab, Prof. Matthew T. Flavin Feb. 2025 –Present
Neural Mechatronics & Extended Reality for Patient Care

- **Extended Reality**: Working on cross-platform VR/AR software design with Unity Engine, which trains participants about the perception and interaction of their surroundings safely.
- **Mechatronic Wearables**: Designing & Developing wearable devices that provide haptic feedback, using digital design & micro fabrication and circuit design.
- **Radio Frequency Perception**: Utilizing Ultra-Wide Band (UWB), in sensor fusion with IMUs, to achieve Non-Line-of-Sight perception and apply them for 3D reconstruction.
- **Computer Network**: Researching WiFi, Thread, and other network technologies/protocols, aiming at developing a high-throughput data transfer method with low latency and bespoke topology.
- **Machine Vision**: Applying YOLO, OpenCV, Stereo Vision, and SLAM to a binocular camera, integrated in ROS2, for the perception of an Unmanned Aerial Vehicle (UAV).

WUHAN UNIVERSITY, ***Wuhan, China***
Advanced Robotics &Intelligent Control, Prof. Xiaohui Xiao, Dean of Robotics Aug. 2023 –Feb. 2025
Advanced Robotics & Intelligent Control

- **Dexterous Manipulation**: Developed a robotic arm that can recognize different kinds of objects and classify them autonomously. Applied a multisensory method to deformable objects.
- **Flexible Sensor Design**: Built a 16-channel ADC embedded system (STM32) with machine learning to analyze thermal and tactile signals. Fabricated the sensor prototype with laser cutting and machining.
- **Object Recognition**: Enabled an object recognition camera with OpenCV for dexterous manipulation. Developed a hand tracking module with two high frame rate grayscale infrared cameras.
- **Teleoperation System**: Combined the hand tracking module and manipulation module together to build a teleoperation system, and enriched it with tactile sensors and haptic feedback devices.
- **Hardware Communication**: Utilized TCP/UDP communication to connect the robotic arm, hand tracking module, and the peripheral circuits that comprise two embedded systems.

Reconfigurable Structure and Metamaterials Design Lab, Prof. Yang Li Sep. 2023 –Feb. 2025
Mechanics & Mechanisms

- **Embedded System**: Built an embedded system (STM32) to control the servo for a quadruped robot with the ability to communicate with the upper computer (serial port) or cell phone (Bluetooth).
- **Robot Walking Gait:** Used a robust crocodile-inspired walking gait for the quadruped robot and designed a frog-inspired jumping gait for it to climb over an obstacle that is twice its height.
- **Software Development**: Developed corresponding upper computer software (Python) to communicate with the embedded system, monitoring the control system of the four-legged robot.
- **Mechanical Design**: Created a MATLAB toolkit, along with demonstration files, to analyze the mechanical design of the robot leg, applying an algorithm for the reverse design of the robot leg.
- **Prototype Manufacturing**: Designed and manufactured a prototype with SOLIDWORKS and 3D printing, assembling the 3D-printed parts with motors and an embedded system.

tHEI Lab, Prof. Kang Liu, Head of Power & Mechanical Eng., Prof. Jun Huang Feb. 2023 –Dec. 2024
Human-Machine Interaction & Electronic Information Interdisciplinary

- **Virtual Reality Development**: Developed a human-machine interaction demo in Unity (C#) to show the application potential of a haptic feedback glove and the embedded system for the glove.
- **Nano Fabrication:** Leveraged digital methods to fabricate a fully flexible electro-osmotic actuator for wearable haptics and the corresponding embedded system, and software (Python) for the wearable.
- **Numerical Calculation Model**: Built a numerical model to calculate the property of the electro-osmotic actuator and optimized the porous material to get a better performance.
- **Bio-Materials**: Utilized hydrogel to build a bio-compatible intracranial temperature regulating device for postoperative recovery after craniotomy surgery.
- **Microfluidics**: Created a bi-phase (nitrogen and water) microfluidics device for pain management , taking advantage of the phase-change latent heat.

EXTRACURRICULARS

RotorJackets, System Engineer, ***Atlanta, GA*** Aug. 2025 –Present

- Funded by Prof. Flavin, designing & developing UAV (quadcopters and fixed wings) platform from hardware to software based on PX4, ROS2, and other open-source projects.
- Integrating the UAV platform with sensors for SLAM application, providing mapping information to the wearable devices for navigation, and obstacles of the participants.

Robot & Artificial Intelligence Club, President, ***Wuhan, China*** Feb. 2023 –Apr. 2024

- Developed a robot dog (Unitree) and trained it to achieve different goals, including walking, turning around, climbing over obstacles, object recognition (YOLO), and ball kicking.
- Developed a multi-robot system that can play soccer with dynamic motion planning, PID control, and a multisensory method, ensuring the robots can perform the given tasks.

PROFESSIONAL SKILLS

Programming: Python (PyTorch, TensorFlow), C/C++, ROS2, MATLAB, C#, Linux, LUA, Swift, CMake
Software: Docker, Keil, AutoCAD, SOLIDWORKS, OriginLab, KeyShot, Photoshop, EAGLE PCB, Fusion 360. Blender, COMSOL, Unity Engine, nRF Connect, Wireshark, XCode (iOS, visionOS), Cloud Computing Services

SELECTED AWARDS

[1] First Prize in the National Industrial and Information Technology Skills Competition VR (national rank: 2)
[2] First Prize in the National Finals of the RoboCom Competition
[3] Merit Student of Wuhan University (top 10%)
[4] Third Prize in the RoboCup China Open Finals (national rank: 5)