WEI PAN

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EDUCATION

Southern University of Science and Technology Sep. 2022 — Jun. 2026 (expected)
B.S. in Robotics Engineering, Department of Mechanical and Energy Engineering GPA: 3.8/4.0

Relevant Course Grades

Robot Modeling and Control: *97/100 A+*
Computer Vision: *93/100 A*
Mechanical Design: *93/100 A*
AI and Machine Learning: *95/100A*
Robotic Actuation System: *95/100 A*
Sensing Techology: *93/100 A*

PUBLICATIONS

[1] C. Zhang, X. Zhang, L. Zheng, **W. Pan**, and W. Zhang, "Generative visual foresight meets task-agnostic pose estimation in robotic table-top manipulation," *Robotics: Science and Systems (RSS), under review, 2025.*

[2] J. Sun, G. Huang, C. Lin, **W. Pan**, K. H. Cheng, G. Gou, et al., "Flexible multi-channel electrical stimulation system for assisting grasping in patients with hemiplegia," in *International Conference on Advanced Robotics and Mechatronics (ICARM), 2024*

[3] G. Gou, K. H. Cheng, J. Sun, C. Lin, **W. Pan**, G. Huang, et al., "Imu-based prediction of multiple grasping gesture intentions for enhanced functional electrical stimulation control*," in *International Conference on Advanced Robotics and Mechatronics (ICARM), 2024.*

RESEARCH EXPERIENCES

UAV Perception and Navigation*(Ongoing)* Mar. 2025 — Present
Supervisor: Prof. Boyu Zhou STAR LAB, Southern University of Science and Technology

- Training **diffusion model** to improve perception ability of UAV on non-Lambertian surfaces, eg. transparent windows of houses
- Optimizing **diffusion model** deployment on NVIDIA Jetson Orin NX.

Manipulation with Video Generation Model and Pose Estimation Jul. 2024 — Jan. 2025
Supervisor: Prof. Wei Zhang CLEAR LAB, Southern University of Science and Technology

- Introduced an innovative closed-loop system that combines **generative visual prediction** with pose estimation **independent of specific tasks**.
- Utilized **rectified flow** for **efficient video generation** which is capable of real-time inference for downstream closed-loop pose estimation.
- Proposed RGB-only input for end effector pose estimation using **Vision Transformer** (ViT).
- Evaluated on LIBERO benchmark, achieve best performance on Libero-Spatial and Libero-Goal among current video prediction methods.achieves the highest performance in LIVING-ROOM-SCENE-6, **surpassing the second-best approach by 18.2%**.

Centaur Robot for Load-carriage Walking Assistance Oct. 2024 — Present
Supervisor: Prof. Chenglong Fu HAR LAB, Southern University of Science and Technology

- Proposed **reinforcement learning** based control strategy for the centaur robot. Designed reward functions for centaur robot well-performing robust walking on multi-terrain and loading conditions
- **Simulation to real-world deployment**, developed real-time control system. **Simulation-to-simulation transfer**, from Legged Gym to MuJoCo deployment to verify policy

- Presented mechanical design, modeling and evaluation of **new wearable load-assistive robot** which forms a human-Centaur quadruped system

Functional Electrical Stimulation and Rehabilitation Sep. 2023 — Mar. 2024
Supervisor: Prof. Chenglong Fu HAR LAB, Southern University of Science and Technology

- Proposed a multi-channel electrical stimulation system to achieve **precise control of hand gripping in stroke patients** and assist in hand function rehabilitation.
- Presents a refined framework utilizing an inertial measurement unit (IMU) for the **real-time recognition of grasp intentions** in stroke patients.
- **Published two IEEE ICARM papers**.

SELECTED AWARDS AND HONORS

- **National First Prize**, National CURC RoboCon 2024 "Granary Returns"– Operation Skills Challenge(8/70), 2024
- **National Second Prize**, National University FPGA and Embedded System Competition, 2024
- **National Second Prize**,National CURC RoboCon 2024 "Granary Returns" - Main Race(23/84), 2024
- **Innovation Award**, National CURC RoboCon 2024 Bionic Legged Robot Challenge(1/86), 2024
- **Sencond Prize Scholarship**, Southern University of Science and Technology, 2024
- **National Second Prize**, National University Physics Experiment Simulation Competition, 2023
- **Outstanding Student 2023**, Southern University of Science and Technology, 2023.
- **Third Prize Scholarship**, Southern University of Science and Technology, 2023

COMPETITION EXPERIENCES

National CURC RoboCon Competition ***Co-Team Leader***
National First Prize, National Second Prize Sep. 2023 — Jul. 2024

- Created a ball object detection dataset on Roboflow, trained a **YOLOv8** model, and completed TensorRT deployment(**280% latency improvement** than using onnx) on Jetson Orin NX for real-time onboard ball detection task
- Mapping using **FAST-LIO2**, performed relocation using **ICP (Iterative Closest Point)**, implemented both on simulation(Gazebo) and real-world
- Built mechanical system, modeling of two robots from scratch, and robust embedded motor control software

National University FPGA and Embedded System Competition ***Team Leader***
National Second prize Sep.2023 — Dec. 2024

- Developed a multi-channel high-performance ionic electronic skin perception system based on Xilinx ZYQN 7020, achieve 2000 Hz sensing frequency, programming using FPGA.
- Developed a real-time master machine software for perception visualization using Qt framework

National University Physics Experiment Simulation Competition ***Team Member***
National Second prize Jul.2023 — Sep. 2023

- Developed two-dimensional diffraction simulation program based on mobile phone screen grating experiment.
- Utilized Qt framework design UI and realize 3D model interaction using C++ and QML.

SKILLS

Programming Skills	Python, C/C++, Java, MATLAB
Libraries and Tools	PyTorch, Sklearn, MuJoCo, ROS/ROS2, TensorRT, ONNX Runtime Legged Gym/Isaac Gym,rsl_rl,Docker/Docker Compose, OpenCV
Mechanical Design	Solidworks, Fusion 360