# Jin Yurui

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## HIGHLIGHTS

- Familiar with mechanical design (SolidWorks, ANSYS), embedded development (STM32, Arduino, PID control), and algorithm simulation (ROS, Gazebo, MoveIt, MATLAB/Simulink)
- Skilled in robot motion planning and control, Python/C programming
- Experienced in 3D modeling, structural optimization, and circuit design(Altium Designer), system integration&test

## EDUCATION

*MSc in Robotics*, **University of Bristol, UK** **Sept 2025-Jul 2026**

**Core Courses:** *Robotics Science & Systems, Robotics Research Technology and Methods， Machine Vision, Advanced Control & Dynamics， Robot Learning for Control, Human-Robot Interaction, Artificial Intelligence for Robotics*

*BEng Mechatronics and Robotics System*, **University of Liverpool, UK** **Sept 2021-Jul 2025**

**Degree Classification: 2:1 (Upper Second Class Honours)**

**Core Courses:** *Continuous and Discrete Time Signals and Systems, Engineering Structures, Digital Electronics, Electronic Circuits and Systems, Fluid Mechanics and Vector Fields for Engineering, Microprocessor Systems, Mechanical Engineering Design, Dynamic Systems, Instrumentation and Control System, Machine Learning, Industrial Automation and Robot Control, Pattern Recognition in Computer Vision, Embedded Computer Systems, Optimization*

## PUBLICATION&PATENT

- Lei Yu, Yurui Jin, Lin Qiao, Gumin Jin, Siying Qin, Yuqing Chen, "A Variable Stiffness Gripper with Dual Leaf-Spring Mechanism", in 19th IEEE International Conference on Automation Science and Engineering, Auckland, New Zealand, August 2023
- Patent for **A Compact Winch Assembly for Cranes** has been obtained
- Patent for **A Mechanical Gripper Based on Flexible Pressure Sensors** has been obtained
- Patent for **Pre-Operational Safety Monitoring Method and System for Complete Machinery** has been obtained

## RESEARCH EXPERIENCE

**Autonomous Navigation and Sensor Fusion on Pololu 3pi Robot** **Oct 2025 – Present**

- Developing a fully autonomous mobile robot pipeline on the Pololu 3pi platform, including perception, localization, and closed-loop motion control.
- Implementing sensor fusion from encoders, magnetometer, and infrared sensors for environment detection and target acquisition.
- Designing real-time behaviours for waypoint navigation, object detection, and physically pushing/transporting targets back to an origin point under time constraints.
- Focus areas: robust control under uncertainty, path planning, and embodied interaction — directly relevant to mobile manipulation and tactile servoing.

**Trajectory Planning Optimization for 6-DOF Robotic Arm Based on RRT** **Sept 2024-Apr 2025**

- Improved RRT* algorithm within ROS MoveIt framework and enhanced path planning efficiency for robotic arms
- Designed and implemented a post-processing optimization algorithm to smooth trajectories and reduce joint shock
- Validated the algorithm and conducted performance testing in the Gazebo simulation environment

**Mecanum Wheel Omnidirectional Mobile Robot (RMO-08)** **Jun– Jul 2024**

- Led mechanical design with SolidWorks, performed 3D modeling and drafted engineering drawings
- Developed kinematic control algorithms by implementing an inverse kinematics solver to decompose chassis motion commands into individual wheel speeds
- Built an embedded control system based on Arduino and programmed closed-loop PID controllers for precise wheel velocity regulation
- Delivered a fully functional and reconfigurable Mecanum-wheel mobile robot prototype that passed all predefined performance tests

**Topology Optimization and Finite Element Analysis of Exoskeleton Thigh Component** **May 2024**

- Responsible for structural design and modeling, established and optimized ANSYS analysis workflow, improved meshing strategy to enhance convergence speed and reduce computational resource consumption

**Variable Stiffness Single-Leg Mechanism and Legged Robot Based on VSA** **Jun-Aug 2023**

- Enhanced the robot jumping performance and energy efficiency by adjusting the position and direction of elastic components in the single-leg mechanism

**Research of Sentiment Analysis in Film based on BERT** **Feb 2023-Apr 2024**

- Developed a Bidirectional Encoding Representation from Transformer-based sentiment analysis model
- Addressed data imbalance by employing techniques such as data augmentation, resampling&weighted loss function.
- Improved model interpretability by visualising model predictions using LIME and SHAP tools

# ROBOTICS ACHIEVEMENTS

**Hangzhi Power Cup 7th National Intelligent Robotics Competition for Chinese Universities** **Jun–Jul 2024**

- In charge of Modeling and Control Lead for an infant inspection robot&designed mechanical structure in SolidWorks
- Enhanced the existing robotic arm with protective housing for electrical components to improve safety and durability
- **Achieved First Prize in Jiangsu Province and Second Prize in the National Finals**

**XJTLU Gmaster Team** **Aug 2021 – Aug 2023**

- Designed and optimized suspension systems and robotic arm mechanisms for infantry and engineering robots
- Conducted 3D modeling (SolidWorks), mechanical analysis, and iterative prototyping of key robotic components
- In charge of machining, assembly and on-site debugging
- **Achievements:**
  - **National First Prize, RoboMaster 2022 National Finals**
  - **National Third Prize, RoboMaster 2022 University Single Event - Infantry Racing & Smart Shooting**
  - Eastern Regional First Prize, RoboMaster 2022 Super Arena Competition
  - Eastern Regional Second Prize, RoboMaster 2022 University Single Event - Infantry Racing & Smart Shooting
  - Third Prize, RoboMaster 2022 University Alliance (Shanghai) – Infantry Arena Competition

# WORK EXPERIENCE

**Yicheng RongChuang Information Technology | R&D Intern** **Jun 2023**

- Developed a remote temperature and humidity monitoring system using ESP32 and C (Arduino IDE)
- Implemented sensor data collection, WiFi connectivity, and MQTT protocol for data transmission

- Built cloud-based data storage and visualization, completing system integration and functional testing