YADONG HUANG

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EDUCATION

Chang Zhou University *Sep 2020 – Jun 2024*
Bachelor in Computer Science and Technology
CI Xbot School and CI InnoX School
GPA: 4.0 / 5.0 (Rank: 4/18)

AWARDS & HONORS

National Undergraduate Electronic Design Competition

- 2023 National First Prize • 2022 Jiangsu First Prize • 2021 National Second Prize

China Undergraduate Mechanical Engineering Innovation Competition

- 2022 Logistics Technology (Crane) Contest – **National Champion & First Prize**

RoboMaster Robotics Competition

- 2022–2024 National Second Prize • 2021 National Third Prize
- 2022 Infantry Speed and Intelligent Design – National First Prize
- 2021–2024 University League First Prize • 2024 Balanced Infantry First Prize

Other National Competitions

- China Robot and AI Challenge 2023 – National Second Prize
- Jiangsu Innovation & Entrepreneurship 2022–2023 – Second Prize

PROJECTS

TeleAvatar: Dual-Arm Wheeled Lifting Teleoperation System *Jul 2025 – Present*
Robotics Engineer

- Developed comprehensive motor drive system based on SocketCAN, providing ROS interface for high-level control; robot comprises Robstride actuators and lifting servo motors with 6-channel CAN bus architecture (8 motors per arm including gripper, 3 motors for omnidirectional chassis)
- Engineered WebSocket-based upper-level control software enabling real-time robot monitoring and teleoperation with low-latency communication
- Implemented state machine management system for coordinating robot behaviors and ensuring safe transitions between operational modes
- Contributed to system integration including sensor data processing, motor synchronization, and teleoperation interface development (excluding core kinematics control algorithms)

- Designed fault detection and recovery mechanisms ensuring robust operation during complex manipulation tasks

XiaoMo Mobile Dual-Arm Robot Product *Oct 2024 – Jun 2025*
Lead Developer (Solo Development)

- Independently led development of complete mobile dual-arm robot featuring differential drive chassis with Mid360 LiDAR, autonomous navigation, SLAM mapping, vision-based dual-arm grasping, and voice interaction
- Implemented full software stack including: chassis driver and control algorithms, autonomous navigation, dual 7-DOF arm drivers and control, web server for status management and robot control, map visualization, JoyCon-based teleoperation, power management module, and app backend integration
- Developed electronic skin tactile sensing system with custom drivers and perception algorithms for enhanced human-robot interaction
- Built comprehensive management platform integrating all subsystems; collaborated with external teams for mechanical design and app frontend development, utilizing open-source algorithms where applicable

Hand Pose Estimation System with ToF Sensor Array *Jan 2025 – Apr 2025*
Developer

- Developed hand pose capture system using ST VL53L9 prototype ToF sensors (54×45 array radar), converting sensor data to ROS-compatible point clouds with coordinate system calibration and transformation
- Integrated three sensors at optimized angles to capture complete hand point clouds, achieving comprehensive coverage of finger and palm regions
- Trained neural network using motion capture 21-joint ground truth data with keypoint-based loss function and gradient descent optimization; deployed ManoTorch model for hand skeleton reconstruction and joint pose estimation from point cloud input

Dexterous Hand and Three-Finger Gripper Development *Jul 2024 – Jun 2025*
Developer

- Developed motor drive and motion control for dexterous hand system using automotive-grade YTM microcontroller with precise current, speed, and position control for miniature brushless motors
- Extended drive board design to develop three-finger gripper and successfully integrated into self-developed 7-DOF arm teleoperation system for robust grasping applications
- Implemented cascaded PID control for fingers and palms, achieving fine motor control critical for delicate manipulation tasks

- Designed comprehensive monitoring and protection systems preventing overcurrent, overheating, and motor stalling; developed user-friendly interfaces and PC communication libraries for seamless integration

Autonomous Navigation for Quadruped Robots *Mar – May 2024*

Bachelor Thesis • Advisor: Prof. Yilin Mo, Tsinghua University

- Configured perception system with Velodyne VLP-16 LiDAR, Intel RealSense D435i, and Nvidia AGX Orin running Ubuntu 20.04 with ROS Noetic
- Achieved 0.01m localization accuracy enabling Unitree Go1 quadruped robot to navigate through 0.4m narrow gaps
- Implemented OpenCV-based target recognition and tracking for enhanced operational capability

RoboMaster Robotics Competition *Oct 2021 – Apr 2024*

Team Captain

- **Vision Team:** Developed auto-aiming system using OpenCV and Extended Kalman Filter, improving fast-target accuracy
- **Infantry (2022):** Led FreeRTOS-based control system with CAN/serial communications for omnidirectional chassis
- **Sentinel (2023):** Implemented Fast-LIO SLAM with Mid360 LiDAR for autonomous attack and defense strategies
- **UAV (2023):** Directed DJI A3-based quadcopter development with adaptive control during dynamic conditions

Additional Projects

- **Motion Control System (2023):** 2D gimbal tracking achieving 0.01m accuracy at 2m+ distance – National First Prize and TI Cup recommendation
- **Tower Crane (2022):** Led team to national championship with 32-second completion time featuring autonomous grasping and navigation
- **Sound Localization (2022):** Developed DOA/FFT-based system achieving ±0.02m precision within 5m range
- **Industrial PLC Software:** Created communication protocols (FINS, PROFINET, Ethernet/IP, DeviceNet) at Changzhou Mingsai Robotics
- **Warehouse Management & Medication Robot:** Built C#/MySQL inventory system and YOLO-v5-based autonomous delivery robot for healthcare

Technical Skills

Programming: C/C++, Python, C#, JavaScript, Qt

Algorithms: Computer Vision (OpenCV), LiDAR/Visual SLAM, Deep Learning, Motion Planning

Embedded Systems: STM32, FreeRTOS, CAN/SocketCAN, Motor Control, Power Management

Robotics: ROS/ROS2, Linux, WebSocket, Sensor Fusion, Teleoperation, State

Machine Design