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 （4/18)

AWARDS

National Undergraduate Electronic Design Competition

- 2023 National Undergraduate Electronic Design Competition, National First Prize
- 2022 Jiangsu Provincial Undergraduate Electronic Design Competition, First Prize
- 2021 National Undergraduate Electronic Design Competition, National Second Prize

China Undergraduate Mechanical Engineering Innovation and Creativity Competition

- 2022 China Undergraduate Mechanical Engineering Innovation and Creativity Competition, Logistics Technology (Crane) Creativity Contest, National First Prize and National Champion

China Robot and Artificial Intelligence Challenge

- 2023 China Robot and Artificial Intelligence Challenge, National Second Prize

RoboMaster Robotics Competition

- 2022-2024 RoboMaster Robotics Competition, National Second Prize
- 2021 RoboMaster Robotics Competition, National Third Prize
- 2021-2024 RoboMaster Robotics Competition, Regional Second Prize
- 2022 RoboMaster Robotics Competition, Infantry Speed and Intelligent Design, National First Prize
- 2021-2024 RoboMaster University League Competition, First Prize
- 2024 RoboMaster University League Competition, Balanced Infantry, First Prize

University Students' Innovation and Entrepreneurship Competition

- 2022-2023 Jiangsu Province University Students' Innovation and Entrepreneurship Competition, Second Prize

PROJECTS

Dexterous Hand Embedded Development Jul 2024 - Present

Developer

- Developed motor drive and motion control for a dexterous hand system using an automotive-grade YTM microcontroller. This involved implementing precise control over current, speed, and position for miniature brushless motors, tailored to the specific needs of robotic applications.
- Implemented cascaded PID control for fingers and palms, improving control accuracy and responsiveness, which are critical for achieving fine motor skills in robotic hands.
- Led the development of monitoring and protection systems to prevent issues including overcurrent, overheating, and motor stalling, ensuring the system operates reliably under various conditions.
- Designed user-friendly interface controls and developed PC communication libraries, facilitating the interaction with the dexterous hand and the integration with other robotic systems.

Autonomous Navigation Perception System for Quadruped Robots Based on Lidar and Machine Vision Mar 2024 - May 2024

Bachelor thesis project, Advisor: Prof. Yilin Mo, Tsinghua University

Developer

- Configured the system with essential hardware and software components, including Velodyne VLP-16 lidar, Intel RealSense D435i depth cameras, and an Nvidia AGX Orin board, running on Ubuntu 20.04 with ROS Noetic.
- Developed a perception and navigation system for the Unitree Go1 quadruped robot, integrating lidar and machine vision technologies.
- Achieved a localization accuracy of 0.01 meters, enabling the robot to maneuver through gaps as narrow as 0.4 meters.

- Implemented target recognition and tracking capabilities using OpenCV to enhance the robot's interactive and operational abilities.

Robomaster Robotics Competition Oct 2021 - Apr 2024

Captain

- **Vision Team Leadership:** Developed a vision auto-aiming system for different robotic units, enhancing target recognition and tracking with OpenCV and Extended Kalman Filter (EKF). This system not only improved accuracy for fast-moving targets but also automated engagement with energy laser targets, earning multiple competition awards.
- **Infantry Leadership (2022 Season):** Led the development of a control system using FreeRTOS, along with CAN and serial communications, which improved the motion control of an omnidirectional chassis robot and its turret.
- **Sentinel Group Leadership (2023 Season):** Implemented mapping, localization, and navigation strategies using Fast-lio under Mid360 LiDAR, which enhanced the robot's operational capabilities. Managed autonomous attacks and developed defensive strategies, enhancing the robot's tactical responses.
- **Unmanned Aerial Vehicle (UAV) Development (2023):** Directed the development and control of a large quadcopter using the DJI A3 flight controller, focusing on stable hovering and adaptive control during dynamic conditions such as bullet firing, ensuring consistent performance.

Motion Control and Target Tracking System Jul 2023 - Jul 2023

Captain

- Developed a target tracking and motion control system for a 2D gimbal using an STM32F407 microcontroller and DJI M6020 motors, paired with a Hikvision industrial camera and FreeRTOS. Employed OpenCV for vision processing and PID for control.
- Achieved tracking and control accurary of 0.01m at the sensory distance of over 2m, resulting in a first-place national award and qualificiation for the Ti Cup recommendation.

Tower crane Mar 2022 - Jun 2022

Captain

- Led the team to a first-place finish at the 2022 National Mechanical Engineering Innovation and Creativity Competition.
- Developed a central rotating tower crane equipped with features for target recognition, automatic grasping, stacking, and obstacle navigation.
- Achieved the competition's fastest completion time of 32 seconds in the finals, showcasing superior mechanical engineering innovation.

Sound Source Localization System Jul 2022 - Jul 2022

Captain

- Developed a one-dimensional sound source localization system for the 2022 Jiangsu Province College Student Electronic Design Competition.
- Deployed a Max9814 microphone array with Direction of Arrival (DOA) and Fast Fourier Transform (FFT) algorithms for sound tracking.
- Improved accuracy with filtering techniques, achieving a precision of ±0.02m within a 5-meter range.

Dispensing Machine Communication Protocol PC Software May 2022 - Jul 2022

Developer

- Led the development of a communication protocol software at Changzhou Mingsai Robotics Technology Co., Ltd., enabling efficient interfacing between industrial PCs and PLCs using third-party open-source codes. Supported major protocols including FINS, PROFINET, Ethernet/IP, and DeviceNet, enhancing compatibility across German and Japanese PLCs. Conducted extensive functional and stress testing to ensure robustness and operational stability.

Intelligent Refillable Pen Core Automatic Feeding Production Line Oct 2022 - Feb 2023

Software Developer

- Led a project to automate the loading and assembly of three-color pen refills, leveraging C# and MySQL for system control. Integrated industrial cameras for defect detection and synchronized operations with PLCs, which improved production efficiency and quality by automating assembly and

eliminating defective units.

Smart Warehouse Inventory Management System Feb 2022 - May 2022

Software Developer

- Developed an advanced inventory management system utilizing C# and MySQL to enhance warehouse operations. Designed a user-friendly interface with dual-mode functionality for administrators and regular users. Integrated vision-triggered recognition with PLC communications, optimizing inventory accuracy and processing speed, which significantly improved warehouse operational efficiency and user interaction.

Intelligent Medication Delivery Robot Jul 2021 - Jul 2021

Captain

- Developed an intelligent medication delivery robot for the 2021 National Undergraduate Electronic Design Competition.
- Integrated advanced navigation systems and digit recognition using Yolo-v5 for accurate medication delivery in healthcare settings.
- Included voice announcement capabilities to enhance interaction and effectiveness in operational environments.

SKILLS LIST

- **Programming**: C/C++, Qt, C#, and Python.
- **Algorithms**: Traditional and deep learning vision based on OpenCV, LiDAR SLAM, visual SLAM.
- **Embedded Systems:** Microcontroller programming, embedded system development.
- **Robotics Systems:** Linux, ROS.