HONGBO (Jason), LI

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RESEARCH INTERESTS

Primary Research Interests: Quadruped robots, Reinforcement Learning, Sim-to-Real
Exploratory Focus: Human-robot interaction, Embodiment Artificial Intelligence

EDUCATION

Heriot-Watt University (HW) 09/2020-06/2024

- **Degree:** Bachelor of Engineering in Robotics with **Honours of the First Class**
- **Score**: 86.87/100,ranked 2/91

Ocean University of China (OUC) 09/2020-06/2024

- **Degree:** Bachelor of Engineering in Computer Science and Technology (joint programme)
- **Score**: 90.44/100

Core Modules: *Robotics Systems Science (86), Linear Control (86), Intelligent Robotics (73), Conversational Agents and Spoken Language Processing (71), Introduction to Robotics (95), Probability Statistics(84.5), Data Structure and Algorithms (96), Integrated Group Robotics Project Ⅰ(92) & Ⅱ (98), Electronics and Circuits (85)*

University College of London (UCL) 09/2024-
Master of Science in Robotics and Artificial Intelligence

RESEARCH EXPERIENCE

Legged Robot that Traverses Challenging Terrain via Reinforcement Learning (dissertation)
Supervisor: Assistant Professor Chengjia Wang, Heriot-Watt University 09/2023 - 05/2024

- **Objective:** Train compact quadruped robot (Dogzilla) to traverse complex terrains using reinforcement learning (PPO algorithm) in the simulation environment Isaac Gym.
- **Keywords:** Quadruped Robot, Reinforcement Learning, Isaac Gym, Locomotion, Terrain.
- **Outcomes:**
  - Robust locomotion for quadruped robots on challenging terrains (over **70% success rate**)
  - Fluent velocity tracking and good walking stability, formulated a stable trotting gait.

Note: During the summer vacation, I am continuing my dissertation project focused on **sim-to-real** transfer , enabling policies learned in the Isaac Gym simulation environment to be applied to a real quadruped robot. The project also involves evaluating walking performance post-transfer, comparing different algorithms, and exploring the application of Large Language Models to various robot training tasks.

10/2022-03/2023

Planning and Control of Underwater Autonomous Vehicle via Hierarchical Reinforcement Learning

- **Subject & Content:** Research on Path Planning and Control of Underwater Autonomous Vehicle (AUV) in Gazebo Virtual Platform Based on Hierarchical Reinforcement Learning
- **Role:**
  - Reinforcement Learning algorithms
  - Use of ROS and Gazebo simulation platform.

A Drone Control Strategy Based on Two Hand Gesture Interaction 11/2021-10/2022

- **Objective:**
  - Develop a dual-layer UAV control model using ResNet and MediaPipe;
  - Explore Jetson Nano for edge-computing and ST-GCN for dynamic gesture recognition .
- **Role**: Researched network models, reproduced TDN, developed gesture recognition on Jetson Nano, managed project planning and documentation.
- **Outcomes**: National and University Level Innovation and Entrepreneurship Training Program.

COMPETITIONS & AWARDS

Contemporary Undergraduate Mathematical Contest in Modelling 09/2022
Held by the China Society for Industrial and Applied Mathematics
- Won Second Prize.

Mathematical Contest In Modeling / Interdisciplinary Contest In Modeling 09/2022
Held by COMAP (the Consortium for Mathematics and Its Applications
- Won Successful Participant.

National Academic Scholarship 2021-2022
Awarded by the Chinese Ministry of Education

Academic Scholarship of Ocean University of China
Awarded by Ocean University of China
- Won First Prize 2021-2022
- Won Second Prize 2022-2023

PROJECTS

A Jeston-Nano-Based Intelligent Library Book Returning Robot 2023 Spring
Team Leader | Score: 98/100
- **Perception Techniques:** Infrared line tracking, RFID book detection, bar code recognition.
- **Robot Design and Construction:** CAD model design, 3D printing, power supply design.
- **Manipulation:** Accurate manipulation for grasping books from the robot base to bookshelves.
- **Product Promotion:** Created a product presentation website and promotional video.

A Courier Station Guidance System Based on DJI Robomaster 2022 Summer
Team Leader | Score: 92/100
- **Visual recognition: P**arcel serial number recognition and matching.
- **Obstacle Avoidance:** Pedestrian detection and automatic braking.
- **Product Promotion:** creative thinking, product presentation, user manual and video making.

Multi-Robot Cruise and Landmark Monitoring Tasks Based on DJI Robomaster 2021 Summer
Team Member| Score: 86/100
- **Multi-robot collaboration**: front vehicle cruising and rear vehicle following.
- **Perception Techniques**: visual-based line tracking; marker detection and recognition.
- **Motion Control:** Chassis motion control via Robomaster APIs, infrared obstacle avoidance.

SKILLS

- **Programming Languages/Skills**: Python; C++; Java; MATLAB
- **Software/Tools**: ROS, ROS2;Isaac Gym, Isaac Sim; Jetson Nano, Raspberry Pi, Arduino
- **Languages:**
  - IELTS: Overall 7.5 (L8; R8.5; S6.5; W6.5) (2022.5);
    Overall 7.0 (L8.5; R7.5; S6.0; W7.0) (2024.6).
  - Spanish: Basic (Duolingo)