

EDUCATION

- University of Manchester** Manchester, UK Sep 2025 - Present
PhD in Robotics and AI: EPSRC Centre for Doctoral Training in Robotics and AI for Net Zero (RAINZ)
- University of Edinburgh** Edinburgh, UK Oct 2022 - Jul 2024
MSc by Research in Informatics: IPAB: Robotics, Computer Vision, Computer Graphics and Animation
- **Award:** Informatics MScR with Merit
 - **Research Project:** Enhance Interpretability: A Bio-Inspired Affect-Consistent Robot Decision and Behaviour Integrated Generation Model
- University of Glasgow, University of Electronic Science and Technology of China** Chengdu, China
Bachelor of Engineering in Electronics and Electrical Engineering Sep 2018 - Jun 2022
- UK-China Joint Program, Math and Programming Major GPA: 88 (UESTC)
UK Upper Second Class Honors
 - **Courses:** Calculus I (91), Linear Algebra and Space Analytic Geometry (95), Probability Theory and Mathematical Statistics (91), Introductory Programming (86), Data Structures (92), Application and Design of Digital Logic (91), Embedded Processors (99), Signals and Systems (90)
 - **Awards:** 2022 Excellent Bachelor's degree thesis of Glasgow College, UESTC, Excellent Leadership College Scholarship, Outstanding Student Scholarship of UESTC

PUBLICATION

- Jinwei Zhang, "Researches advanced in human-computer collaboration and human-machine cooperation: from variances to common prospect," in 2nd AIAHPC 2022, 10 November 2022, <https://doi.org/10.1117/12.2641865>
- Jinwei Zhang, J.Michael Herrmann, "A Robotic Mind Model for Affective Decision Making and Behaviour Generation", International Journal of Social Robotics, 2025, Under Revision

RESEARCH EXPERIENCE

- Enhance Interpretability: A Bio-Inspired Affect-Consistent Robot Decision and Behaviour Integrated Generation Model** Edinburgh, UK
MRes Student | Supervisor: Michael Herrmann, Lecturer | University of Edinburgh Oct 2022 – Jan 2024
- Proposed a framework for robots to react to external stimuli and have emotional waves inspired by natural creation's emotional arousal mechanism and physiology
 - Designed robot motion planning and decision-making mechanism with emotional dynamics calculated
 - Simulated and optimized the emotional dynamics intervened decision and behaviour integrated model in human-robot interaction scenarios based on ROS and Gazebo
- Principle and Implementation of Context-Driven Human-Machine Collaboration Model** Chengdu, China
Research Assistant | Advisor: Longjiang Li, Associate Professor | UESTC Sep 2021 – Jun 2022
- Designed a novel context-driven Human-Machine Collaboration model
 - Optimized the Human-Machine Collaboration model by introducing human affect context into the reinforcement learning approaches of MDP and POMDP
 - Simulated the collaboration model through ROS and DESPOT, a POMDP solver, and improved the simulation of human affect by adjusting the noise of observation and the degree of affect
- Automatic generation and optimization of HCI interface of complex system** Chengdu, China
Research Assistant | Advisor: Longjiang Li, Associate Professor | UESTC Jul 2021 – Jan 2022
- Proposed research plan for automatic regeneration of complex system HCI interface
 - Optimized the task model utilized in interface generation based on Finite State Automation by adding weights reflecting user features in order to realize customized user-specific interface generation
 - Designed generation method based on optimized Weighted Finite State Acceptor considering mapping relationship of task model and generated interface
- Research on Endogenous Security Mechanism and Context Efficient Transfer Technology for Human-Machine Collaboration (HMC)** Chengdu, China

Research Assistant | Advisor: Longjiang Li, Associate Professor | UESTC

Jan 2021 – Nov 2021

- Established the context structure based on entity classification and context reasoning
- Designed HMC context update and synchronization process tailoring to control and decision making of Human-Machine Collaboration system from machine to human side interface and vice versa
- Conducted research on security mechanisms and compression methods under our context framework by attaching various labels on branches of the context tree and so on

Design and optimization of a heterogeneous communication SDN network system architecture with cloud center and multiple access edge gateways

Chengdu, China

Research Assistant | Advisor: Longjiang Li, Associate Professor | UESTC

Jun 2019 - Dec 2020

- Contributed to the design and application of path state estimation and optimal path calculation
- Designed information collective interface from edge networks based on pub/sub mode and relevant simulation
- Conducted network system simulation based on Mininet-wifi in Linux environment and Floodlight on Windows as SDN controller, verified the optimization mechanism
- Contributed to the writing of technical reports on general architecture, verification and API specification

Fault-tolerant synchronization for remote pseudo-random functions

Chengdu, China

Research Assistant | Advisor: Longjiang Li, Associate Professor | UESTC

Dec 2019 - Mar 2021

- Designed a synchronization method for remote pseudo-random functions based on compression of code number
- Conducted simulation and performance analysis of the synchronization using Python, and the recovering failure rate can dive to 10^{-6} when the loss rate of the communication channel reaches 0.05
- Applied a patent for a fault-tolerant synchronization method based on short numbering embedding as the second inventor (the first one is the advisor)

RESEARCH COURSE PROJECTS

Multi-Agent Reinforcement Learning in antagonistic games | Group Leader

Jul 2021 - Sep 2021

Authorized by Prof. Pietro Lio', Dept of Computer Science and Technology, University of Cambridge

- Conducted multi-agent reinforcement learning (MARL) based on environments of PettingZoo, a newly established multi-agent game environment similar to OpenAI gym
- Led 2 teammates to complete environment processing, policy evaluating and model training of MARL based on the environment "Knights Archers Zombies" in PettingZoo, which is a multiplayer antagonistic game to kill Zombies
- Visualized variation rate of training results like value loss and policy gradient loss in training episodes

Intelligent tracking multiple functions rover | Leader of Patio 2

Organized by Glasgow College, UESTC and testing field provided by UESTC

Mar 2021 - Jun 2021

- Wrote the main program of the tasks in Patio 2 (part two of the task field) and was responsible for the field test of Patio 2, where three tasks should be completed including matching the colour of recognized square to determine direction, releasing fish food into the lake, and communication to a laptop.
- Designed the workflow and code architecture of the second Patio tasks, led and communicated with teammates to understand the motivation functions they wrote and completed the main program utilizing the development platform STM32CubeIDE and microcontroller STM32F446RE
- Designed and assembled the fish-feeding device composed of a mechanical arm and a cup
- Tuned colour recognizing and tracking functions and enhanced movement accuracy rate in task 1 from around 30% to over 90%, and calibrated compass affected by the iron handrail in the field test

Room classification based on deep neural networks

Oct 2020 - Nov 2020

Authorized by Dr. Evelyn, Stanford University

- Designed a CNN model to classify messy and clean rooms, and got around 85% accuracy on our test set, higher than the 80% accuracy obtained by baseline models conducted for comparison
- Employed the pre-trained model (ResNet18 and ResNet34) and by training this model, the test accuracy reached 100%
- Wrote a technique report for this room classification project

LANGUAGE ABILITY AND OTHER SKILLS

- Language: English (fluent), Chinese (native)
- Skills: 6 years of programming and engineering experience, experienced in Python, C++, MATLAB, Linux system operation, ROS (Robot Operating System), ROS2, CNN