Zuo Jia

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Education

Nanyang Technological University (NTU) **Aug 2023 – Present**
Master of Science: Computer Control and Automation
School of Electrical and Electronic Engineering Singapore

GPA: 4.69/5.0

Harbin Institute of Technology at Weihai (HIT) **Sep 2019 – Jun 2023**
Major: Measurement and Control Technology and Instruments
Bachelor of Engineering Weihai, China

GPA: 84.22/100 IELTS: 6.5

Project Experience

Dexterous manipulation – Currently Research **May 2024 – Present**
Supervised by Prof.Renjing Xu and Dr.Jony Zhang

Deep Diffusion Models for Vital Signal Estimation – Currently Research **Sep 2023 – Present**
Supervised by Dr.Jianfei Yang and Prof.Lihua Xie

- Developing a Transformer and conditional Diffusion model based algorithm, aiming to isolate pure human vital signals (respiratory and pulse).

Reinforcement Learning Solve Distributed Flow-Shop Scheduling Problem **Oct 2022 – May 2023**

- Solved Distributed Flow-Shop Scheduling Problem (DFSP) using value based reinforcement learning (RL) algorithm, which is my undergraduate thesis at HIT.

Electronic Control Software Architecture Project based on RT-Thread **Sep 2020 – May 2022**

- Designing the entire embedded software for a robot, including two-axis gimbal control, embedded drive development, and sophisticated algorithms enabling remote-controlled operations such as bombing, movement, and vision-based automatic targeting and engagement etc..
- Contributed to the RT-Thread community by fixing critical CAN and PWM driver bugs.

Motor Intelligent Control Board Software Development Project **Jul 2021 – Feb 2022**

- Developed algorithm for Motor Intelligent Control Board, enabling automatic calibration of initial position, angle, and speed loops. Implemented master-slave auto-processing and integrated motor stall and disconnection alarms.

2022 XbotPark Smart Product Innovation Boot Camp **Jul 2022 – Apr 2022**

- Developed demos for two startup ideas as a Full Stack Engineer. Gained expertise in design thinking, user research, smart hardware design, and product management, etc..

HIT Mathematical Competition Team **Sep 2020 – Nov 2021**

- Led a team to participate in four national-level mathematical contests, used Python, Mathematica, and SPSS for modelling.

Anti-jamming Adaptive Exposure Algorithm Project **Jan 2021 – Apr 2021**

- Developed algorithms to automatically identify and remove large light spots and use PI controller to achieve automatic exposure for large target detection.

Self-Balanced Two-wheeled Smart Car Project in the National Intelligent Car Race **Nov 2019 – Sep 2020**

- Engineered balance and motion control algorithms using a PID cascade controller and Kalman filter with six-axis sensors for car stability. Developed electromagnetic tracking and adaptive road condition algorithms for navigating roundabouts, sharp turns, and ramps.

Smartwatch Project in the National Undergraduate Electronics Design Contest **Nov 2019 – Sep 2020**

- Implemented features including body temperature monitoring, step counting, automatic screen lighting upon wrist lift, and sleep posture detection using an anti-bright screen algorithm.

Professional Skills

Programming language: Python, C programming
Model (Based on PyTorch): Transformer, Diffusion
Platform: STM32, MSP430, STC, LPC, Linux
Software: Skilled with Keil, IAR, LabView, SPSS; familiar with MATLAB, Webots, Solidworks
Embedded Real-Time Systems (RTOS): RT-Thread

Leadership Experience

HERO Competitive Robot Team – Team Leader Jan 2021 – Sep 2022
HIT 718 Smart Car Laboratory - Team Leader Sep 2019 – Sep 2021

Honors

National-Level Awards

- 1^{st} **Prize** in the Final Round of the National College Students' ROBOMASTER 2022 Infantry Robotic Competition 08/2022
- 2^{nd} **Prize** in the Final Round of the National College Students' ROBOMASTER 2022 Robotic Competition 08/2022
- 2^{nd} **Prize** in the Final Round of the National College Students' ROBOMASTER 2021 Robotic Competition 08/2021
- 2^{nd} **Prize** in 2021 Higher Education Cup National Undergraduate Mathematical Contest in Modeling 11/2021

Regional-Level Awards

- 1^{st} **Prize** in the Eastern Division of the National College Students' ROBOMASTER 2022 Robotic Competition 08/2022
- 1^{st} **Prize** in the Northern Division of the National College Students' ROBOMASTER 2021 Robotic Competition 08/2021

Provincial-Level Awards

- 1^{st} **Prize** in the 11th Shandong University Student Science and Technology Festival - Science and Technology Museum Exhibit Creativity and Production Design Competition 11/2019
- 2^{nd} **Prize** in the National College Students Mathematical Contest in Modeling, Shandong Division 10/2020
- 2^{nd} **Prize** in the Shandong Division of National Undergraduate Electronic Design Competition 10/2020

Other Honors and Scholarships

- **Zeshi Scholarship (Top 10 in HITwh)** 04/2023
- **Junior Product Manager**, rewared by 2022 XbotPark Smart Product Innovation Robot Camp 08/2022
- **Second-class Scholarship**, sponored by Harbin Institute of Technology (Weihai), 2020-2021 Spring Semester 05/2021
- **Outstanding individual in science and technology**, issued by School of Information Science and Engineering, Harbin Institute of Technology (Weihai) 12/2020
- **Outstanding Student Leader**, rewared by Harbin Institute of Technology (Weihai) 12/2020
- **Science and Technology Innovation Scholarship**, sponored by Harbin Institute of Technology (Weihai), 2019-2020 Fall Semester 10/2020

Related Courses

NTU

- Computer Control and Automation (5.0/5.0)
- Linear System (5.0/5.0)
- Machion Vision (5.0/5.0)
- System Analysis (5.0/5.0)

HIT

- Analogue Electronic Technology Experiment (94)
- Advanced Project-driven Electronic Technology Experiment (93)
- College Computer (91)
- C Language Programming (96)
- Error Theory and Data Processing (95)
- MCU Application Expansion Experiment (95)
- Single-chip Microcomputer Principle and Interface Technology (95)
- Virtual Instrument Software Design (95)
- Electronic Technology Practice (96)
- Automation Measurement Technology (92)
- Fiber-Optic Communications Technology (92)