Muhuan **Wu**

AI Engineer · Product Owner

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Educational Background

Xi'an Jiaotong-Liverpool University

Suzhou, China

BEng in Mechantronics and Robotics System — *Sep. 2018 - Jul. 2022*

- Core Modules: Information and Control System, Dynamic Systems, Microprocessor Systems, Digital Electronics, Engineering Mechatronics, Machine Learning, Pattern Recognition
- Final-Year Project (FYP): Development of a Compuer Vision System for a Robot Grasping Workstation

University of Bristol

Bristol, UK

MSc in Biorobotics — *Sep. 2022 - Nov. 2023*

- Core Modules: Robotics systems, Biosystems and Biorobotics, Learning, Computation and the Brain, Bioinspired AI, Introduction to Artificial Intelligence
- Dissertation Project: Representation Learning for Deep Reinforcement Learning Based Robotic Grasping

Internship & Work Experience

Sky Sys (Enabling Drones) Co., Ltd

Suzhou, China

Robotics Engineer Intern — *Oct. 2019 - Feb. 2020*

- Participate in the mechanical structure design of the drone charging airport;
- Optimize visual algorithms (OpenCV and earlier visual models, such as VGG16, Resnet18, etc.) for drone charging airports to identify and detect cracks on drone propellers;
- Familiar with some basic knowledge of drones, and built a quad-rotor drone with a wheelbase of 450 using APM2.8 flight control;
- Be familiar with basic control algorithms and put them into practice, such as PID, LQR, etc.

Moham Digital Technology Co., Ltd.

Shanghai, China

AI Engineer · Project Manager · Product Owner · Researcher · Mechanical Engineer — *Dec. 2023 - present*

- AI Engineer: By integrating the Neo4j knowledge graph with large language models (such as Camel-AI, Modelscope, and Langchain),I provided support for multiple agent systems at State Grid, focusing on intelligent design, intelligent auditing, intelligent Q&A, and report generation;
- AI Engineer: Other AI application projects involved include 3D posture detection, speech-to-text, depth estimation, and deploying lightweight RAG models using Jetson AGX Orin, providing a variety of AI solutions;
- AI Engineer, Project Manager and Product Owner: Recruited a team and collaborated with Camel-AI (Eigent AI) to architect a large language model project for Langxin Technology, encompassing advanced capabilities such as RAG, Text2SQL, and intelligent question-answering. The initiative integrated knowledge graphs, vector databases, text segmentation, and intelligent agents, delivering bespoke solutions tailored to client needs. Throughout the project, I was chiefly responsible for liaising with the client to elucidate requirements, drafting technical specifications, formulating task lists, coordinating with all stakeholders, authoring critical code, managing the project's Git repository, composing technical documentation, and documenting daily stand-up meetings;
- Researcher: Responsible for drafting feasibility studies, technical specifications, project proposals, project estimation documents, interim and final reports, publishing papers, patents, and software copyrights, among other tasks. Engaged in communication with vendors to obtain third-party quotations. On-site at institutions like the Research Institute, I facilitated stakeholder interactions, gathered project documentation, and participated in review meetings;
- Mechanical Engineer: Involved in the mechanical design of ultra-high voltage cable serpentine laying equipment, including tasks such as mechanical structure design, 3D modeling, rendering, sensor selection, and the development of control algorithms.

Academic Research & Projects during University Studies

Robomaster Team at XJTLU

Suzhou, China

Computer Vision Group — *Oct. 2018 - Jun. 2019*

- Participated in the G-Master intra-school robotics competition and the Shenzhen Robomaster International Preliminary Competition, securing the third-place award in the international preliminaries;
- Utilized OpenCV and other deep learning algorithms for armor plate recognition, and contributed to the development of the PID-based robot gimbal control algorithm;
- Familiar with or knowledgeable about the Robomaster robot system, including STM32, various types of brushless servomotors, conductive slip rings, Mecanum wheel control, and ROS (Robot Operating System).

Summer Undergraduate Research Fellowship (SURF) at XJTLU

Suzhou, China

Member of the Computer Vision Group

Jun. 2021 - Sep. 2021

- Contributed to the development of motion control algorithms for B&R industrial robots;
- Developed a target recognition system for a robotic platform, integrating deep learning algorithms such as YOLO, SSD, and Mask R-CNN, along with RealSense depth camera calibration using Zhang's method;
- Integrated a real-time emergency stop trigger system for the robotic platform by combining Gaussian Mixture Model-Hidden Markov Model (GMM-HMM) with Long Short-Term Memory (LSTM) for acoustic event recognition.

Other Undergraduate Projects at Xi'an Jiaotong-Liverpool University

Suzhou, China

Course Projects

Sep. 2018 - Sep. 2022

- Simulated various systems using MATLAB's Simulink and Simscape platforms, including an LQR-controlled self-balancing car with physical implementation and a quadruped robot walking model trained with the Deep Deterministic Policy Gradient (DDPG) reinforcement learning algorithm;
- Reimplemented algorithms such as Multi-Layer Perceptron (MLP) and Parzen Windows from scratch without relying on any third-party libraries for datasets like Fashion-MNIST in a pattern recognition course.

Other Graduate Projects at the University of Bristol

Bristol Robotics Lab, UK

Course Projects

Sep. 2022 - Nov. 2023

- Fabricated a soft robotic gripper using Ecoflex-00-30 silicone elastomer;
- Designed and developed a prototype of an underwater detector for collecting seawater samples;
- Implemented task-specific solutions for the Franka Panda robotic arm in Isaac Gym and Isaac Sim by integrating tactile sensors, Proximal Policy Optimization (PPO) reinforcement learning models, and Variational Autoencoder (VAE) representation learning.

Publication

Conference Paper: ICARA 2023

Abu Dhabi, The United Arab Emirates

State: Published

Nov. 2022

- **Title:** "Emergency Stop System of Computer Vision Workstation Based on GMM-HMM and LSTM"
- **Research Focus:** Proposed an enhanced emergency stop system with accelerated trigger sound recognition by integrating Gaussian Mixture Model-Hidden Markov Model (GMM-HMM) with Long Short-Term Memory (LSTM).
- **DOI:** 10.1109/ICARA56516.2023.10125926

Conference Paper: EMIS 2024

Chengdu, China

State: Published

Apr. 2024

- **Title:** "Automated Report Generation and Knowledge Management System for Photovoltaic Power Stations using Knowledge Graphs"
- **Research Focus:** Developed an automated photovoltaic report generation system for the power grid using Neo4j knowledge graphs.
- **DOI:** 10.2991/978-94-6463-447-1_39

Conference Paper: AIVRV 2024

Nanjing, China

State: Published

Dec. 2022

- **Title:** "A Multimodal Virtual Reality System for Switchgear Operation Training: Integration of Dynamic Gesture and Speech Recognition"
- **Research Focus:** Developed a power grid training VR system integrating gesture recognition, speech recognition, and control algorithms.
- **DOI:** 10.1109/AIVRV63595.2024.10859792

Honors & Awards

International

2019 **3rd Prize**, RoboMaster 2019 International Regional Competition — *Shenzhen, China*

Certifications & IT Skills

IELTS Test

Suzhou, China

Test attended on 2021

24. Apr. 2021

- IELTS overall 7.0, Speaking 6.0, Reading 7.0, Writing 6.5, Listening 7.5

Project Management Professional (PMP) Certification *Shanghai, China*

2024 *30. Nov. 2024*

IT Skills

Project Experience

- **AI:**Machine Learning, Deep Learning, Representation Learning, Reinforcement Learning, Imitation Learning, Large Language Models
- **Tech Stack:**SolidWorks, Fusion 360, KeyShot, Python, C++, MATLAB, Git, Latex etc.
- **Other:**Robotics and Control, Microcontroller Systems, Edge Computing, etc.

Career Plan

Aspiring to continue contributing comprehensive and cutting-edge AI solutions to real-world implementation projects. With a multidisciplinary background, I aim to gradually transition towards project management and product management roles.