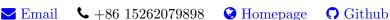
# Shiyao Sang



### Education

2020 - 2022	Master of Science in Computer Science University of Wollongong, NSW, Australia (QS World Ranking 167)
2020 - 2022	Master of Engineering in Computer Technology Central China Normal University, Wuhan, China (211 Project University)
2014 - 2018	Bachelor of Engineering in Computer Science and Technology Huaivin Institute of Technology, Jiangsu, China

### Research Interests

- Robot Operating System
- Deep Reinforcement Learning
- Social Robot

# Research and Projects

### Next-Generation Planning Framework Development

July 2024 - May 2025

- Contributed to the design and implementation of a novel planning decision-making framework, focusing on communication modules, mapless planning, lateral sampling.
- Proposed and validated a reinforcement learning method for trajectory generation at intersections without high-definition maps, enhancing mapless planning capabilities.
- Led the development of Advance Adaptive Cruise Control (ACC) trajectory generation.
- Explored hybrid planning approaches by integrating rule-based and learning-based methods for city NOA scenarios, and investigated end-to-end planning architectures.

#### Hybrid Network Communication Middleware (RIMAOS2C) May 2023 - August 2024

- Designed and Implemented a service discovery based hybrid communication middleware.
- Integrated multiple communication channels via hierarchical service discovery, enabling efficient software and hardware communication.
- Optimized data flow to reduce message redundancy and improve cross-chip communication consistency.
- Deployed on NVIDIA Orin X domain controllers, supporting L4-level Robotaxi, Robotruck.
- Paper: Manuscript under review at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2025.

#### State Transition Model for Educational Robots

April 2021 - April 2022

- Designed and Implemented a multi-turn dialogue system grounded in mathematical problemsolving models.
- Implemented multi-channel collaborative control on the NAO robot platform, elevating interactive mathematics tutoring for children.

- Leveraged Azure Cognitive Services to enhance natural language understanding and streamline control-flow logic.
- Thesis: "Design and Implementation of a State Transition Model for Educational Robot Tutoring Math Homework."

#### RIMA Service Robot Development

October 2016 - June 2018

- Developed RIMA, a service robot with navigation and conversational abilities using ROS.
- Designed a multi-layer chatbot system with Azure Bot framework and Seq2seq technology.
- Proposed the RIMA markup language for dynamic knowledge base updates and semantic processing, action planning.
- Thesis: "A Multi-Layer Architecture for Intelligent Chatbots in IoT Robots: Design and Implementation."

# Professional Experience

#### Software Engineer & Algorithm Engineer

March 2023 - March 2025

Chery Automobile Co., Ltd., Shanghai, China

- The member of the autonomous driving operating system department, responsible for designing, implementing, and deploying a robust communication and scheduling system for intelligent vehicles.
- The member of the foresight algorithm team in the planning department, focusing on adaptive mapless trajectory generation and hybrid planning algorithms that integrate neural networks with rule-based method.

#### Software Engineer

July 2022 - January 2023

Cowa Technology Co., Ltd., Shanghai, China

• The member of a romote driving system group, responsible for advance network secure module and auido module .

#### **Publications and Patents**

#### **Under Review**

• S. Sang, "Service Discovery-Based Hybrid Network Middleware for Efficient Communication in Distributed Robotic Systems," *IROS* 2025.

#### **Patents**

- "An Adaptive Trajectory Generation Method for Intersections Without High-Precision Maps." (Pending)
- "A Software Architecture for Mapping Signals to Topics in SOME/IP Service." (Pending)
- "A Streaming Media Speed Measurement Tool Based on Timestamp Differences." (Granted)

# Technical Skills

- Programming Languages: C++, C#, Python
- Robotics: ROS, Cyber RT, Distributed Middleware

- Machine Learning Frameworks: TensorFlow, PyTorch
- Algorithms: Deep Reinforcement Learning (DQN, Q-Learning), Path Planning (A\*, D\*, RRT\*), Multi-Agent Systems
- Technical Tools: OpenCV, YOLO, EasyOCR

# **Awards and Honors**

- Member, Cognitive Robotics Technology Committee, RAS
- Third Prize, 2018 Microsoft Imagine Cup Global Student Technology (Suzhou Regional Final Competition), Microsoft
- Silver Award, 2017 Zhongxing Cup Pan-Pearl River Delta University Students Computer Final Competition, CCF
- Second Prize, 2017 China Engineering Robot Competition, CAA
- Excellence Award, Fifth Jiangsu Province Science University Student Humanities Knowledge Competition, JHEA

# Languages

• Chinese: Native

• English: Intermediate