Shiyao Sang

Email +86 15262079898 Homepage Github

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**
Huaiyin 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 problem-solving 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 & Algorithms 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