Yuqing Lin

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Experienced in sequential decision-making, visual navigation, and Unity-based simulation, with research spanning robust policy learning, vision-language-based navigation, and learning-based control in dynamic environments.

Education

Nanyang Techonological University — Singapore
Doctor of Philosophy, Civil and Environmental Engineering — *Aug. 2022 – Apr. 2026*

The University of Hongkong — HKSAR
Master of Engineering in Industrial Engineering and Logistics Management — *Sep. 2019 – Dec. 2020*

Fuzhou University — China
Bachelor of Engineering in Logistics Engineering (Port Logistics) — *Sep. 2015 – Jun. 2019*

Research Experience

Research Fellow — June 2026 – Present
Nanyang Techonological University — *Singapore*

- Developed open-vocabulary visual navigation for autonomous agents in Unity-based 3D environments, integrating text-guided visual perception with RL-based control.
- Currently extending this work toward VLM-based visual detection and multimodal perception for more generalizable, language-aware autonomous agents.

PhD Researcher — Aug. 2022 – May 2026
Nanyang Techonological University — *Singapore*

- Progressed from multi-agent Q-learning to multi-objective DRL and shared-policy PPO for autonomous navigation under dynamic interactions and partial observability.
- Built closed-loop simulation environments and introduced CNN-based visual perception, enabling agents to incorporate surrounding environmental cues into navigation and control.
- Extended RL-based navigation toward vision-language perception, establishing the foundation for current work on open-vocabulary and VLM-based autonomous agents.

Projects

Visual & Language-Guided Navigation | *CNN, GroundingDINO, CLIP, PPO* — Aug. 2025 – Present

- Extended RL navigation from visual-rule perception to language-guided semantic perception.
- Enabled robust navigation across complex and unseen port environments.

Robust Navigation with Deep RL | *MODRL, Shared PPO, Curriculum Learning* — Jan. 2024 – Jul. 2025

- Progressed from multi-objective policy learning to shared PPO for multi-USV navigation.
- Improved robustness and generalization under partial observability and dense traffic.

Multi-Agent Navigation — Safety 4.0 | *Q-Learning, Multi-Agent Navigation* — Aug. 2022 – Dec. 2023

- Developed enhanced Q-learning for multi-USV pathfinding and collision avoidance.
- Improved navigation efficiency over classical planning and RL baselines.

Publications

Accepted

- **Lin, Y.,** Li, X., & Yuen, K. F. (2025). "Machine learning applications for risk assessment in maritime transport: Current status and future directions". *Engineering Applications of Artificial Intelligence*, 155, 110959. [JCR Q1, IF:9.0]
- **Lin, Y.,** Du, L., & Yuen, K. F. (2025). "Multiple unmanned surface vehicles pathfinding in dynamic environment". *Applied Soft Computing*, 172, 112820. [JCR Q1, IF:7.8]

- **Lin, Y.,** Xin, J., Zhang, R., & Yuen, K. F. (2025). "A multi-objective deep reinforcement learning framework for adaptive navigation of unmanned surface vehicles". *Applied Energy*, 401, 126809. [JCR Q1, IF:12.2]

Submitted

- **Lin, Y.,** Cheng, R., Wang, N., & Yuen, K.F. "Optimizing Intermodal Freight Flow Under Extreme Weather Disruptions", *Expert Systems with Applications* (under review). [JCR Q1, IF:9.4]
- **Lin, Y.,** Zhang, R. & Yuen, K. F. "IoT-Enabled Autonomous Maritime Navigation in Smart Ports: A Curriculum-Guided Shared Policy Learning Framework", *IEEE Internet of Things Journal* (under review). [JCR Q1, IF:8.7]
- **Lin, Y.,** Zhang, R. & Kim, Y. R. "Visual Rule-Guided Deep Reinforcement Learning for Autonomous Ship Navigation in IALA-Regulated Port Environments", *Engineering Applications of Artificial Intelligence* (under review). [JCR Q1, IF:9.0]
- **Lin, Y.,** & Kim, Y. R. "Language-Grounded Semantic Target Navigation for Autonomous Surface Vehicles", *Advanced Engineering Informatics* (under review). [JCR Q1, IF:11.5]

In Preparation

- **Lin, Y.,** Zhang, R. & Kim, Y. R. "PHAROS: Compositional Visual Memory for Few-Shot Maritime Object Detection", in preparation.

Conference

- **Lin, Y.,** & Yuen, K. F. (2025) "Multiple unmanned surface vehicles pathfinding in dynamic environment", peer-reviewed paper presented at the *International Association of Maritime Economists Conference*, Norway, Jun. 24-27.
- **Lin, Y.,** & Kim, Y. R. (2026) "Visual Rule-Guided Deep Reinforcement Learning for Autonomous Ship Navigation in IALA-Regulated Port Environments", peer-reviewed paper presented at the *Smart Ships, Secure Seas, Sustainable Futures(SMRC X MTEC/ICMASS)*, Singapore, Apr. 22-23.

Technical Skills

AI & Learning: Reinforcement Learning, Multi-Agent RL, Multi-Objective RL, Curriculum Learning, Sequential Decision-Making
Vision & Perception: Vision-Language Models, Object Detection & Tracking
Frameworks & Simulation: PyTorch, TensorFlow, Unity / ML-Agents, ROS / Gazebo, VRX, OpenCV; Python, C#