Lingxiao Wang

2301 Timberline Ct., Ruston, LA 71272

Email: lwang@latech.edu | Phone: +1 (386)-679-5947

Short Biography

- Research interests in **Intelligent Systems**, **Robotics**, and **Embodied Artificial Intelligence**
- Published 11 Peer-Review Papers
- Tenure-Track Assistant Professor of Electrical Engineering at Louisiana Tech University

---

Education

Embry-Riddle Aeronautical University (ERAU)	Daytona Beach, FL
Ph.D. in Electrical Engineering and Computer Science	Jan 2018 – Dec. 2021

- Dissertation: Robotic Olfactory-based Navigation with Mobile Robots

M.S. in Electrical and Computer Engineering	Sept. 2015 – Dec. 2017

- Graduate with Distinction

Civil Aviation University of China (CAUC)	Tianjin, China
B.Eng. in Telecommunication Engineering	Sept. 2012 – July 2015

Academic Appointments

Louisiana Tech University (LaTech)	Ruston, LA
Assistant Professor - Tenure Track, Dept. of Electrical Engineering	Sep. 2022 – Present

- Teach courses in control theories and artificial intelligence (AI).
- Research areas in robotics and AI.

Visiting Assistant Professor	ERAU
ERAU, Dept. of Electrical Engineering and Computer Science	Jan. 2022 – May 2022

- Taught senior design class and electrical engineering fundamental circuit classes.

Research Experience

Wildfire Early Detection with Unmanned Aircraft Systems (UASs)

Principal Investigator, LaTech	March 2022 – Present

- Developed a multi-rotor UAS and installed a camera and a smoke detector to obtain visual and olfactory observations to sense the existence of wildfire;
- Adapted a deep learning-based object detector, i.e., YOLOv7, to automatically identify wildfire smokes and flames from visual observations;
- Designed an olfactory-based navigation algorithm that guides the UAS to trace smoke plumes as cues to approach the wildfire location;

Robotic Odor Source Localization with AI Methods

Researcher, LaTech & ERAU	Jan. 2018 – Present

- Designed navigation algorithms to direct mobile robots finding an odor source in unknown environments, incorporating various AI methods, including reinforcement learning, deep learning, and fuzzy inference systems;

- Predicted source and plume distributions based on partially observable Markov decision process and hidden Markov model – source and plume estimates were dynamically combined to generate reward functions through a fuzzy inference system for reinforcement learning.
- Developed deep learning models to learn traditional odor search algorithms and implemented them in on-vehicle tests after the training.
- Prepared and submitted 2 proposals related to this topic as PI to Louisiana RCS program and NSF CRII program.

Multi-agent Coordination with Reinforcement Learning Methods

Research Assistant, ERAU   Jan. 2020 – March 2021

- Coordinated five unmanned surface vehicles (USVs) to collaboratively search 20 mobile objects over the 100×100 m^2 ocean surface by designing a swarm-based coordination algorithm using reinforcement learning methods.
- Defined robot search behaviors by designing various types of reward functions to encourage search behaviors that detect mobile objects and avoid inter-vehicle collision.
- Implemented the proposed coordination algorithm in on-vehicle experiments and summarized the algorithm and experiment results in a manuscript.

Publications (Google Scholar)

Selected Peer-Reviewed Journal Articles:

1. **Wang Lingxiao**, Pang Shuo, Li Jinlong, *"Olfactory-Based Navigation via Model-Based Reinforcement Learning and Fuzzy Inference Methods,"* IEEE Transactions on Fuzzy Systems (**impact factor: 12.029**), 2020.
2. **Wang Lingxiao** and Pang Shuo, *"Robotic Odor Source Localization via Behavior-based Navigation and Fuzzy Inference Methods,"* Robotics and Autonomous Systems, 2021.
3. Miao Runlong, **Wang Lingxiao**, Pang Shuo, *"Coordination of Distributed Unmanned Surface Vehicles via Model-Based Reinforcement Learning Methods,"* Applied Ocean Research, 2022.

Selected Peer-Reviewed Conference Articles:

1. **Wang Lingxiao** and Pang Shuo, *"Chemical Plume Tracing using an AUV based on POMDP Source Mapping and A-star Path Planning,"* OCEANS 2019 MTS/IEEE Seattle. IEEE, 2019.
2. **Wang Lingxiao** and Pang Shuo, *"An Implementation of the Adaptive Neuro-Fuzzy Inference System (ANFIS) for Odor Source Localization,"* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
3. **Wang Lingxiao**, Pang Shuo, and Li Jinlong, *"Learn to Trace Odors: Autonomous Odor Source Localization via Deep Learning Methods,"* IEEE International Conference on Machine Learning and Applications (ICMLA), 2021.

Professional Activities

Manuscript Reviewer:

- International Conference on Robotics and Automation (ICRA 2022, 2023, 2024)
- IEEE International Conference on Machine Learning and Applications (ICMLA 2021)
- International Conference on Ubiquitous Robot (UR 2021)

Member of

- IEEE, IEEE Robotics and Automation Society, IEEE Computational Intelligence Society
- ERAU Robotics and Autonomous Systems Laboratory.