

Lingxiao Wang

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Research Areas:

My research involves *Robotics*, *Autonomous Systems*, and *Intelligent Systems*. I focus on developing *intelligent decision-making models* to navigate/control robotic agents.

Education:

- 2021: **Ph.D. in Electrical Engineering and Computer Science**,
Embry-Riddle Aeronautical University, Daytona Beach, FL 32114.
Dissertation: Robotic Olfactory-based Navigation with Mobile Robots.
GPA: 4.0/4.0
- 2018: **M.S. in Electrical and Computer Engineering**,
Embry-Riddle Aeronautical University, Daytona Beach, FL 32114.
GPA: 4.0/4.0
- 2016: **B.S. in Telecommunication Engineering**,
Civil Aviation University of China, Tianjin, China.
GPA: 3.5/4.0

Professional Experience:

- 2022 – : **Assistant Professor**,
Dept. of Electrical Engineering,
Louisiana Tech University, Ruston, LA 71272
- 2021 – 2022: **Visiting Assistant Professor**,
Dept. of Electrical Engineering and Computer Science,
Embry-Riddle Aeronautical University, Daytona Beach, FL 32114
- 2018 – 2021: **Graduate Teaching Assistant**,
Dept. of Electrical Engineering and Computer Science,
Embry-Riddle Aeronautical University, Daytona Beach, FL 32114

Honors and Awards:

- 2023: **RED Travel Grant Award**,
Louisiana Tech University
- 2020: **Outstanding Doctoral Student** of Electrical Engineering and Computer Science,
Embry-Riddle Aeronautical University
- 2017: **Outstanding Master Student** of Electrical Engineering and Computer Science,
Embry-Riddle Aeronautical University

Scholarship:

Articles in Peer-Reviewed Journals (*Corresponding Author)

- [J1] Khan Raqib Mahmud, **Lingxiao Wang***, Sunzid Hassan, and Zheng Zhang. “A Knowledge-Driven Framework for Robotic Odor Source Localization using Large Language Models” *Robotics and Autonomous Systems* (IF: 4.3), 2025.
- [J2] Sunzid Hassan, **Lingxiao Wang***, and Khan Raqib Mahmud. “Integrating Vision and Olfaction via Multi-Modal LLM for Robotic Odor Source Localization.” *Sensors* (IF: 3.4), 2024.

- [J3] Sunzid Hassan, **Lingxiao Wang***, and Khan Raqib Mahmud. "Robotic Odor Source Localization via Vision and Olfaction Fusion Navigation Algorithm." *Sensors* (**IF: 3.4**) 24, no. 7, 2309, 2024.
- [J4] **Lingxiao Wang***, and Shuo Pang. "Autonomous Underwater Vehicle Based Chemical Plume Tracing via Deep Reinforcement Learning Methods." *Journal of Marine Science and Engineering* 11, no. 2, 366, 2023.
- [J5] **Lingxiao Wang**, and Shuo Pang*. "Robotic Odor Source Localization via Adaptive Bio-Inspired Navigation using Fuzzy Inference Methods." *Robotics and Autonomous Systems* (**IF: 4.3**) 147, 103914, 2022.
- [J6] Runlong Miao, **Lingxiao Wang**, and Shuo Pang*. "Coordination of Distributed Unmanned Surface Vehicles via Model-Based Reinforcement Learning Methods." *Applied Ocean Research* (**IF: 4.3**) 122, 103106, 2022.
- [J7] **Lingxiao Wang**, Shuo Pang*, and Jinlong Li. "Olfactory-Based Navigation via Model-Based Reinforcement Learning and Fuzzy Inference Methods." *IEEE Transactions on Fuzzy Systems* (**IF: 11.9**) 29, no. 10, 3014-3027, 2020.

Articles in Peer-Reviewed Conferences

- [C1] **Lingxiao Wang**, Snorre Starnes, Sunzid Hassan, Alexander Isiani, Cheston Sturdivant, Hoang My Le, Khan Raqib Mahmud. "Deep Learning-based Aerosol and Ocean Data Retrieval from Satellite Polarimeter Measurements." Accepted in *2025 IEEE SoutheastCon*, IEEE, 2025.
- [C2] Khan Raqib Mahmud, **Lingxiao Wang**, Jinyuan Chen, Xiyuan Liu, and Sunzid Hassan. "Comparative Analysis of Deep Learning Approaches for Predicting Thermomechanical Behavior of Shape Memory Polymers." Accepted in *2025 IEEE SoutheastCon*, IEEE, 2025.
- [C3] Khan Raqib Mahmud, **Lingxiao Wang**, Xiyuan Liu, Jiahao Li, and Sunzid Hassan. "Deep Learning-based Wildfire Smoke Detection using Uncrewed Aircraft System Imagery." In *2024 21st International Conference on Ubiquitous Robots (UR)*, pp. 580-587. IEEE, 2024.
- [C4] Sunzid Hassan, **Lingxiao Wang**, and Khan Raqib Mahmud. "Multi-Modal Robotic Platform Development for Odor Source Localization." In *2023 Seventh IEEE International Conference on Robotic Computing (IRC)*, pp. 59-62. IEEE, 2023.
- [C5] **Lingxiao Wang**, and Shuo Pang. "Robotic Odor Source Localization via End-to-End Recurrent Deep Reinforcement Learning." In *2023 Seventh IEEE International Conference on Robotic Computing (IRC)*, pp. 43-50. IEEE, 2023.
- [C6] **Lingxiao Wang**, Shuo Pang, Mantasha Noyela, Kevin Adkins, Lulu Sun, and Marwa El-Sayed. "Vision and Olfactory-Based Wildfire Monitoring with Uncrewed Aircraft Systems." In *2023 20th International Conference on Ubiquitous Robots (UR)*, pp. 716-723. IEEE, 2023.
- [C7] **Lingxiao Wang**, Ziyu Yin, and Shuo Pang. "Learn to Trace Odors: Robotic Odor Source Localization via Deep Learning Methods with Real-world Experiments." In *IEEE SoutheastCon 2023*, pp. 524-531. IEEE, 2023.
- [C8] **Lingxiao Wang**, Shuo Pang, and Jinlong Li. "Learn to Trace Odors: Autonomous Odor Source Localization via Deep Learning Methods." In *2021 20th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pp. 1429-1436. IEEE, 2021.
- [C9] **Lingxiao Wang**, and Shuo Pang. "An Implementation of the Adaptive Neuro-Fuzzy Inference System (ANFIS) for Odor Source Localization." In *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 4551-4558. IEEE, 2020.

- [C10] **Lingxiao Wang**, Shuo Pang, and Guangyu Xu. “3-Dimensional Hydrothermal Vent Localization based on Chemical Plume Tracing.” In *IEEE Global Oceans 2020: Singapore–US Gulf Coast*, pp. 1-7. IEEE, 2020.
- [C11] **Lingxiao Wang**, and Shuo Pang. “Chemical Plume Tracing using an AUV based on POMDP Source Mapping and A-star Path Planning.” In *OCEANS 2019 MTS/IEEE SEATTLE*, pp. 1-7. IEEE, 2019.
- [C12] **Lingxiao Wang**, and Shuo Pang. “AUV Navigation based on Inertial Navigation and Acoustic Positioning Systems.” In *OCEANS 2018 MTS/IEEE Charleston*, pp. 1-8. IEEE, 2018.

Research Grants:

- [G1] **PI:** June 2024 – June 2027, “Advancing Embodied AI for Enhanced Robotic Odor Source Localization”, Louisiana Board of Regent, **\$108,000, Funded.**
- [G2] **PI:** August 2024 – August 2025, “Deep Learning-based Aerosol and Ocean Parameter Retrieval from Polarimeter and Lidar Data”, LaSPACE Research Enhancement Award, **\$35,000, Funded.**
- [G3] **PI:** August 2024 – August 2025, “Predicting New Thermoset Shape Memory Polymers via Transformers and Graphic Neural Networks”, Louisiana LAMDA Seed Grant, **\$40,000, Funded.**
- [G4] **PI:** Feb. 2025 – Jan. 2026, “CO₂ Monitoring via an Integrated Robotic and Sparse Sensor System”, NSF FUEL, **\$124,799, Funded.**
- [G5] **PI:** July 2025 – June 2026, “Empowering the Future Workforce of Electrical Engineering for Louisiana Energy Industry”, NSF FUEL, **\$100,000, Funded.**
- [G6] **PI:** June 2025 – May 2026, “Enhancing Control Systems Education through the Modernization of the Automatic Control Laboratory at Louisiana Tech University”, Louisiana Board of Regent – ENH: Targeted, **\$56,999, Pending.**
- [G7] **PI:** Sep. 2025 – Aug. 2027, “Enhancing Wildfire Early Detection with Integrated Visual and Olfactory Sensing on Uncrewed Aircraft Systems”, NSF – ERI, **\$194,375, Pending.**
- [G8] **PI:** Sep. 2025 – Aug. 2027, “Integrating Vision and Olfaction for Intelligence Agents in Robotic Odor Source Localization”, NSF - CRIL, **\$166,895, Pending.**
- [G9] **PI:** Jan 2026 – Dec 2029, “FEC: Robotic Vision and Olfaction Integrated Wildfire Early Detection and Localization using Uncrewed Aircraft Systems”, NSF, **\$6,000,000, Pending.**
- [G10] **PI:** July 2025 – June 2026, “Enhancing Data Retrieval for NASA’s Earth and Space Science Measurements using Deep Learning Methods”, NASA LA-EPSCoR, **\$39,497, Pending.**
- [G11] **PI:** Aug. 2025 – Aug. 2026, “RFA-045: Multi-Modal Transformer-based Image Segmentation for Enhanced Foreign Object Debris Detection in RGB and Thermal Images”, NASA R3, **\$125,000, Pending.**
- [G12] **PI:** July 2025 – July 2026, “Towards Efficient and Robust Embodied Decision-making in Autonomous Driving”, Louisiana Transportation Research Center, **\$39,891, Pending.**

Teaching Experiences:

Louisiana Tech University

2022 –

- **ELEN 471:** Automatic Control Systems
 - This course centers on automatic control systems, including topics of system modeling, control system analysis, PID, and root locus controllers.
 - Received **4/4** in teaching evaluation surveys in 2022 and 2023 academic years.

- **ELEN 472: Digital Control Systems**
 - This course focuses on digital control systems, including topics of z-transform, system stability test, controllability and observability, and digital controller designs.
 - Received **4/4** in teaching evaluation surveys in 2022 and 2023 academic years.
- **ELEN 451/CSC 499: Hands-on AI and Robotics**
 - This course introduces AI & Robotics fundamentals, including neural networks, supervised learning, reinforcement learning, Transformers, Large Language Models, etc.
 - This course incorporates a series of small-scale projects that allow students to implement the learned knowledge to solve actual problems.

Embry-Riddle Aeronautical University

2018 – 2022

- **EE 327: Electrical Engineering Fundamentals**
 - This is an introduction course of Electrical Engineering, covering topics in electrical circuits, Ohm's Law, and logic circuits.
 - Received positive teaching evaluation that surpasses the department average in 3 consecutive years.
- **CS 450: Senior Design Projects**
 - Instructed 50 senior students for senior design projects.

Service:

Service to Profession

- Manuscript Reviewer for Professional Journals:
 - Elsevier Expert Systems with Applications
 - Elsevier Building and Environment
 - MDPI Drones
 - SICE Journal of Control, Measurement, and System Integration
- Manuscript Reviewer for Peer-Reviewed Conferences:
 - International Conference on Robotics and Automation (ICRA) 2022, 2023, and 2024
 - IEEE International Conference on Machine Learning and Applications (ICMLA) 2021
 - IEEE International Conference on Ubiquitous Robot (UR 2021)
- Mail Reviewer for Federal Funding Agency Programs:
 - NASA Vermont EPSCoR Preproposal Review

Service to Academic Program

- Faculty Search Committee 2024-2025
 - Committee member in searching for Assistant Professor or Electrical Engineering
- Ph.D. Committee
 - Committee Chair: Khan Mahmud, Sunzid Hassan
 - Committee Member: Jiahao Li, Deepak Lama, Vivya Kalidindi, Ramon Mufutau, Yan Deng.
- Student Organizations
 - Faculty Advisor: Louisiana Bulldog Robotic Club