Joseph Ferdinand O'Leary

Curriculum Viate

June 2025 443-425-7950 joleary1@umd.edu
joe.oleary.314@gmail.com

1 Education

Ph.D., Reliability Engineering Ant. May 2026
Advisor: Dr. Yunfei Zhao
University of Maryland, College Park

B.S., Mechanical Engineering May 2022
Minor: Nuclear Engineering
University of Maryland, College Park

2 Research Experience

Improving the Efficiency of Dynamic Probabilistic Risk Assessment Aug 2023 - Present
Graduate Researcher Project PI: Dr. Yunfei Zhao Univ. of MD
Funding Source: Nuclear Energy University Partnership Program
Application of advanced machine learning techniques to decrease the computational cost of dynamic PRA. Responsible for creation and implementation of novel algorithm and previous solutions for dynamic PRA for comparison. References [6, 3, 2]

Improved Analysis and Visualization of Dynamic Probabilistic Risk Assessment Simulation Data May 2025 - Present
Graduate Researcher Project PI: Dr. Katrina Groth Univ. of MD
Funding Source: US Nuclear Regulatory Commission
Develop new methods and tools to improve the analysis and visualization of dynamic probabilistic risk assessment simulation data. Responsible for development of data pre-processing and initial machine learning processing model.

Improvement of Bayesian Network Models for Human Reliability Analysis Jan 2023 - Aug 2023
Graduate Researcher Project PI: Dr. Katrina Groth Univ. of MD
Funding Source: US Nuclear Regulatory Commission
Creation of new Bayesian network models for human reliability analysis using cognitive science and expert elicitation. Responsible for generating quantification schemes for the networks. Reference [4]

3 Teaching and Mentoring Experience

Undergraduate Researcher Mentoring Aug 2024 - Jun 2025
Mentor for undergraduate students Univ. of MD

ENME472 Capstone Engineering Design Aug 2022 - Dec 2022
Graduate Teaching Assistant Univ. of MD

ENME350 Analog Electronics Aug 2021 - May 2022
Undergraduate Teaching Fellow Univ. of MD

ENME382 Introductory Materials Engineering Aug 2020 - May 2021
Undergraduate Teaching Fellow Univ. of MD

4 Publications

4.1 Conference Proceedings

- [2] Joseph O'Leary, Mohamed Y. Nassar, and Yunfei Zhao. "A Sequential Decision-Making Formulation of Dynamic Probabilistic Risk Assessment". In: *Proceedings of teh 19th International Conference on Probabilistic Safety Assessment and Analysis*. Accepted Manuscript. 2025

- [3] Joseph O'Leary and Yunfei Zhao. "Improving the Efficiency of Dynamic Probabilistic Risk Assessment with Monte Carlo Tree Search and Importance Sampling". In: *Proceedings of Advanced Reactor Safety (ARS)*. 2024. DOI: 10.13182/T130-43343

- [6] Yunfei Zhao and Joseph O'Leary. "Solving Large Fault Trees with Importance Sampling and Tree Search". In: *2024 Annual Reliability and Maintainability Symposium (RAMS)*. 2024, pp. 1–6. DOI: 10.1109/RAMS51492.2024.10457836

- [4] Joseph O'Leary, Yunfei Zhao, and Katrina Groth. "A Survey of Parameterization Techniques for Bayesian Network Models for Human Reliability Analysis". In: *2023 PSAM Conference on AI and Risk Analysis for Probabilistic Safety/Security and Management*. 2023

- [5] Nadia Zaleski et al. "Modeling and Experimental Identification of Peritoneal Cavity Pressure Dynamics During Oxygenated Perfluorocarbon Perfusion". In: *2022 European Control Conference (ECC)*. IEEE, 2022. DOI: 10.23919/ecc55457.2022.9838204

- [1] Mahsa Doosthosseini et al. "Estimating the Impact of Peritoneal Perfluorocarbon Perfusion on Carbon Dioxide Transport Dynamics in a Laboratory Animal". In: *2022 American Control Conference (ACC)*. IEEE, 2022. DOI: 10.23919/acc53348.2022.9867437