

# 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 the 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