

GENEVIEVE E. FLASPOHLER

32 Vassar St, Room 32-330 ◊ Massachusetts Institute of Technology ◊ Cambridge, MA 02139

(906) · 370 · 9318 ◊ geflaspo@mit.edu ◊ geflaspohler.com

EDUCATION

**Massachusetts Institute of Technology &
Woods Hole Oceanographic Institution Joint Program**

September 2016 - September 2022

Ph.D. in Electrical Engineering and Computer Science & Applied Ocean Engineering

Advised by: John W. Fisher III and Nicholas Roy

Balancing Exploration and Exploitation: Task-Targeted Exploration for Scientific Decision-Making

S.M. in Electrical Engineering and Computer Science

September 2016 - September 2018

Advised by: Yogesh Girdhar and Nicholas Roy, GPA: 5.00/5.00

Statistical Models and Decision Making for Robotic Scientific Information Gathering

University of Michigan

September 2012 - June 2016

B.S.E. in Computer Engineering, GPA: 3.98/4.00, *Summa Cum Laude*

CURRENT RESEARCH

Massachusetts Institute of Technology & Woods Hole Oceanographic Institution

Cambridge, MA

September 2016 - September 2022

Graduate Student Research Assistant, Electrical Engineering and Computer Science

My research aims to advance **scientific machine learning and experimental design** through the lens of decision-making and Bayesian modeling. I develop planning algorithms that leverage structured models and reason about uncertainty in partially observable and dynamic environments. Applications of interest include scientific robotics, large-scale environmental monitoring, oceanography, and climate/weather forecasting.

Technical areas: Sequential decision-making, POMDPs, Bayesian experimental design and statistics, scientific machine learning, reinforcement learning, uncertainty quantification, robotics.

INDUSTRY EXPERIENCE

nLine - Machine Learning Research Consultant

Berkeley, CA

September 2020 - Present

- Developed graph discovery algorithms to infer underlying power grid topology from sensor readings.
- Worked collaboratively to develop sensor deployment plans for Ghana, Sierra Leone, Kenya and Nigeria.

Microsoft Research - Machine Learning and Statistics Research Internship

Cambridge, MA

May 2020 - August 2020

- Developed online learning algorithms for subseasonal weather and climate forecasting
- Combined physics-based numerical weather prediction and deep-learning based forecasting models
- Worked with Lester Mackey (MSR), Judah Cohen (Atmospheric and Environmental Research) and the Microsoft Research AI for Earth team

Esri, Environmental Systems Research Institute - Software Internship

Washington, D.C.

May 2019 - August 2019

- Developed spatial statistics package for exploratory correlation analysis on multiple geographic scales
- Collaborated with local governments to assess UN Sustainable Development Goals using spatial data

FANUC Robotics America - Robotics Internship

Rochester Hills, MI

May 2014 - August 2014

- Built web interface for FANUC robots, presented at International Manufacturing Technology Show

JOURNAL AND CONFERENCE PUBLICATIONS

1. **Flaspohler, G.**¹, Preston, V.¹, Michel, A. PM, Fisher, J.W, & Nicholas Roy (2022). *Robotic Planning under Uncertainty in Spatiotemporal Environments in Expeditionary Science*. Reinforcement Learning and Decision-Making (RLDM), 2022.
2. Mouatadid, S., Orenstein, P., **Flaspohler, G.**, Oprescu, M., Cohen, J., Wang, F., Knight, S., Geogdzhayeva, M., Levang, S., Fraenkel, E., & Lester Mackey (2021). *Learned Benchmarks for Subseasonal Forecasting*. arXiv preprint arXiv:2109.10399.
3. **Flaspohler, G.**, Orabona, F., Cohen, J., Mouatadid, S., Oprescu, M., Orenstein, P., & Lester Mackey (2021). *Online Learning with Optimism and Delay*. Proceedings of the 38th International Conference on Machine Learning (ICML), 2021.
4. **Flaspohler, G.**, Roy, N., & John W. Fisher III (2020, December). *Belief-Dependent Macro-Action Discovery in POMDPs using the Value of Information*. Advances in Neural Information Processing Systems (NeurIPS), 2020.
5. **Flaspohler, G.**, Caruso, F., Mooney, T. A., Katija, K., Fontes, J., Afonso, P., & Shorter, K. A. (2019, December). *Quantifying the Swimming Gaits of Veined Squid (*Loligo forbesi*) using Bio-logging Tags*. Journal of Experimental Biology (JEB), 2019.
6. **Flaspohler, G.**¹, Preston, V.¹, Michel, A. PM., Girdhar, Y., & Nicholas Roy. (2019, September). *Information-Guided Robotic Maximum Seek-and-Sample in Partially Observeable Continuous Environments*. IEEE Robotics and Automation Letters (RA-L), 2019.
7. Girdhar, Y., Cai, L., Jamieson, S., McGuire, N., **Flaspohler, G.**, Suman, S., & Brian Claus. (2019, May). *Streaming Scene Maps for Co-Robotic Exploration in Bandwidth Limited Environments*. Robotics and Automation (ICRA), 2019 IEEE International Conference on. IEEE, 2019.
8. Doherty, K., **Flaspohler, G.**, Roy, N., & Yogesh Girdhar. (2018, September). *Approximate Distributed Spatiotemporal Topic Models for Multi-Robot Terrain Characterization*. Intelligent Robots and Systems (IROS), 2018 IEEE/RSJ International Conference on. IEEE, 2018.

IROS 2018 Best Paper Award Finalist

9. **Flaspohler, G.**, Roy, N., & Yogesh Girdhar. (2018, May). *Near-optimal irrevocable sample selection for periodic data streams with applications to marine robotics*. Robotics and Automation (ICRA), 2018 IEEE International Conference on. IEEE, 2018.
10. **Flaspohler, G.**, Roy, N., & Yogesh Girdhar. (2017, September). *Feature discovery and visualization of robot mission data using convolutional autoencoders and Bayesian nonparametric topic modeling*. Intelligent Robots and Systems (IROS), 2017 IEEE/RSJ International Conference on. IEEE, 2017.

INVITED PRESENTATIONS AND WORKSHOP PUBLICATIONS

1. **Flaspohler, G.** (2022, August). *Learned Benchmarks for Subseasonal Forecasting*. Presentation at the ASA Joint Statistical Meeting, Washington D.C. USA.
2. **Flaspohler, G.** (2022, July). *Online Learning with Optimism and Delay*. Invited presentation in the statistical machine learning session at the IMS Annual Meeting on Probability and Statistics, London U.K.
3. **Flaspohler, G.** (2021, July). *Autonomous Trajectory Planning for Mapping Deep Sea Hydrothermal Plumes*. Presentation in the session on Advancing Ocean Exploration Technology at the Ocean Sciences Meeting.
4. **Flaspohler, G.** (2020, December). *Machine Learning for Scientific Discovery*. Presentation at the MIT Quest for Intelligence Student Seminar.
5. **Flaspohler, G.** (2019, December). *Autonomous Sensing and Scientific Machine Learning for Monitoring Greenhouse Gas Emissions*. Publication at the NeurIPS Workshop on Tackling Climate Change with Machine Learning 2019, Vancouver, BC.
6. **Flaspohler, G.** (2019, October). *Tutorial on Gaussian Process Regression for Spatial and Temporal Environmental Data*. Presentation at the Computational Sustainability Doctoral Consortium 2019, Carnegie Mellon University, PA.
7. **Flaspohler, G.**¹, Preston, V.¹, Michel, A. PM., Girdhar, Y., & Nicholas Roy. (2019, November). *Information-Guided Robotic Maximum Seek-and-Sample in Partially Observeable Continuous Environments*. Presentation at Intelligent Robots and Systems (IROS), 2019 IEEE/RSJ International Conference on. IEEE, 2019.
8. **Flaspohler, G.** (2018, September). *Models and Decision-making for Scientific Robots*. Presentation at the Computational Sustainability Doctoral Consortium 2018, Cornell University, NY.
9. **Flaspohler, G.** (2017, December). *Feature discovery and visualization of robot mission data using convolutional autoencoders and Bayesian nonparametric topic modeling*. Presentation at the NeurIPS Workshop on Women in Machine Learning Workshop 2017, Long Beach, CA.
10. **Flaspohler, G.**, Silva, T., Mooney, A., & Girdhar, Y. (2017, June). *Classifying dolphin whistles using convolutional neural networks*. Presentation at the meeting of the Acoustical Society of America 2017, Boston MA.

Best Student Presentation in Applied Ocean Engineering Runner-up.

11. **Flaspohler, G.** (2017, February). *Enabling curious Bayesian marine robotic exploration*. Presentation at MIT Robocon 2017, Cambridge MA.
12. **Flaspohler, G.**¹, Adkins, J.¹, & Prabal Dutta. (2015, September). *Ving: Bootstrapping the Desktop Area Network with a Vibratory Ping*. In Proceedings of the 2nd International Workshop on Hot Topics in Wireless (pp. 21-25). ACM.

TEACHING AND OUTREACH EXPERIENCE

Environmental Data Science Journal, *Communications Editor*

Computational Sustainability Doctoral Consortium, *Co-orgaznizer (2019) and mentor (2020)*

MIT EECS Communication Lab, *Scientific Communication Fellow* *September 2019-Present*

Teaching: Massachusetts Institute of Technology *Cambridge, MA*

6.419: Applied Statistics, Computation, and Applications *September - December 2019*

Teaching: University of Michigan

EECS 281: Advanced Algorithms and Data Structures in C++

ENGR 100: Introduction to Human Centered Design

Ann Arbor, MI

January 2016 - June 2016

January 2013 - June 2015

AWARDS AND GRANTS

1. NeurIPS Outstanding Reviewer (Oct 2021).
2. Microsoft AI for Earth, summer research fellowship (May 2020)
3. National Science Foundation Graduate Research Fellowship, \$102,000 plus tuition (2016 - Present)
4. University of Michigan's Engineering Distinguished Achievement Award, \$500 (May 2016)
5. University of Michigan's EECS William L. Everett Student Award of Excellence, \$500 (May 2016)
6. University of Michigan's EECS Scholar, \$500 (May 2016)
7. NSF REU Undergraduate Research Award, \$1,500 (May 2015)
8. University of Michigan's Electrical Engineering and Computer Science Outstanding Achievement Award, \$500 (May 2015)
9. University of Michigan's Marian Sarah Parker Prize, \$1,000 (May 2015)
10. University of Michigan's Darl F. and Lorene O. Caris Dean's Merit Scholarship full-ride, \$130,000 (September 2012 - May 2016)