



## **Inference and Planning for Autonomous Monitoring in Complex Environments**

Genevieve Flaspohler

Advisor: John Fisher

Massachusetts Institute of Technology

[geflaspo@mit.edu](mailto:geflaspo@mit.edu)

### **Abstract:**

Observational studies serve as the foundation of many scientific endeavors; however, modern measurement techniques such as hand-sampling by scientists or satellite imagery struggle to resolve the spatial distributions and temporal trends of highly-dynamic phenomena. Autonomous mobile robots equipped with sensors for in situ measurements are well-suited to address this gap in sensing. To be most effective, these agents need to be able to understand and respond to their environments. We will discuss PLUMES, an informative path planning framework which enables intelligent behaviors for the problem of source localization in an unknown environment (e.g., particulate emissions sites, volcanic vents, wastewater outfalls), and then expand upon the results of PLUMES to discuss further open challenges at the intersection of robotics and autonomous science.