

# JOHANNA HANSEN

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## EDUCATION

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### McGill University, Montreal, QC

2016 – 2021

Ph.D. in Computer Science (expected), Mobile Robotics Lab

Thesis work on Model-Based Decision Making in Scientific Sampling Robots

### University of Texas at San Antonio, San Antonio, TX

2012 – 2015

Graduate coursework (30 hours) in Electrical Engineering, Digital Signal Processing

### Texas State University, San Marcos, TX

2007 – 2011

B.S. in Electrical Engineering and B.S. in Environmental Geography

## TECHNICAL SKILLS

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**Expertise:** Machine Learning, Reinforcement Learning, Planning and Localization, Sensors, Scientific Data Science, Signal Processing, Communication and Networking, Environmental Geography

**Software:** Scientific Python (numpy, pytorch, scikit-learn, pandas), ROS, C/C++, Matlab

**Hardware:** Sensors, Embedded Systems, Localization Systems, Marine Instrumentation

**Data:** Images, Geospatial, Time Series, Scientific Sensors, Robot Navigation

## EXPERIENCE

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### NASA Jet Propulsion Lab (JPL)

Summer 2019, current affiliate

*Research Intern and Remote Affiliate, Mobility and Robotics Section*

*Pasadena, CA*

- Worked on machine vision aspects of the Mars Sample Return Project. Implemented state-of-the-art geometric and direct object localization methods for finding sample tubes on the Martian terrain with care given to estimation uncertainty and computational performance. Developed a model which learns to contextually switch between different object localization methods.

### McGill University

Jan 2016–current

*Graduate Researcher, Mobile Robotics Lab*

*Montreal, QC*

- Research on model-based planning and reinforcement learning with generative models for mobile agents.
- Spearheaded collaboration with ecologists to develop automatic classification and spatial modeling of zooplankton in Canadian lakes. Led research and design of strategic marine sampling with custom low-cost floating sensors and autonomous surface vehicles.
- Built system for portable underwater vehicle localization using low-cost USBL/GPS components

### Woods Hole Oceanographic Institution (WHOI)

Jan 2014 – Sept 2015

*Autonomous Underwater Vehicle Engineer, National Deep Submergence Facility*

*Woods Hole, MA*

- Software/Data/Electrical Engineer for deep-diving autonomous underwater vehicles (AUVs) working in research and ship-board operational environments. Assisted in AUV deployments, hardware repair and maintenance, autonomous robot navigation, software development, networking and communications for robots and staff, acoustic and visual mapping of the seafloor, and scientific data analysis.

### Southwest Research Institute (SwRI)

Jan 2012 – Dec 2013

*Engineer, Automation and Data Systems Division*

*San Antonio, TX*

- Primary end-to-end software engineer building a mapping sensor consisting of acoustic transducers, DSP, camera, and embedded computer with remote control and interpretation. Developed sampling, filtering, visualization scheme and beamforming calibration routine for live acoustic data.

### Lower Colorado River Authority (LCRA)

Jan 2011 – Dec 2011

*Engineering Coop, Telecommunications Department*

*Austin, TX*

- Configured SONET, fiber, ethernet, and microwave systems for critical communication infrastructure.