

JOHANNA HANSEN

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EDUCATION

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

Expertise: Machine Learning, Reinforcement Learning, Robotic Path Planning, 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

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.

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.