JOHANNA HANSEN

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EDUCATION

McGill University, Montreal, QC *2016 –2021*
Ph.D. in Computer Science, Centre for Intelligent Machines
Thesis in mobile robotics
Advised by Dr. Gregory Dudek

University of Texas at San Antonio, San Antonio, TX *2012 – NA*
Coursework for M.S. in Electrical Engineering with concentration in Digital Signal Processing
Thesis Topic: *Understanding Sea Ice using Unmanned Aerial Vehicles*

Texas State University, San Marcos, TX *2007-2011*
B.S. in Electrical Engineering with concentration in Networking and Communication
Capstone: *Current Signatures to Identify Devices in the Power Grid*
Advised by Dr. Stan McClellan
B.S. in Geography with concentration in Environmental and Resource Geography

Selected Coursework: Machine Learning, Robotics, Digital Signal Processing, Digital Filters, Control Systems, Wavelets, Numerical Estimation, Wireless Communications, Networking, Data Compression and Error Coding, Graph Theory, Geographic Information Systems, Physical Geography, Environmental Resource Management, Water Resources

PUBLICATIONS

Manjanna, S., Hansen, J., Quattrini L. A., Rekleitis, I., Dudek, G., *Collaborative Sampling Using Heterogeneous Marine Robots Driven by Visual Cues*, Canadian Conference on Computer and Robot Vision, 2017.

Quattrini L. A., Rekleitis, I., Manjanna, S., Kakodkar, N., Hansen, J., Dudek, G., Bobadilla, L., Anderson, J., and Smith, R., *Data Correlation and Comparison from Multiple Sensors over a Coral Reef with a Team of Heterogeneous Aquatic Robots*, International Symposium on Experimental Robotics, 2016.

Hansen, J., Fourie, D., Kinsey, J., Pontbriand, C., Ware, J., Farr, N., Kaiser, C., and Tivey, M., *Autonomous Acoustic-Aided Optical Localization for Data Transfer*, 2015 IEEE Oceans.

Pontbriand, C., Farr, N., Fourie, D., Hansen, J., Kinsey, J., Pelletier, J., and Ware, J., *Wireless Data Harvesting Using the AUV Sentry and WHOI Optical Modem*, 2015 IEEE Oceans.

Hansen, J., Wilden, G., Abbott, B., and Green, R., *The Ultrasonic Culvert Inspection System (UCIS): A Low-Cost Device for Conduit Inspection*, 2014 Transportation Research Board 93rd Annual Meeting.

PROFESSIONAL ACTIVITIES

Technical Skills

· *Software*: Scientific Python, C/C++, Matlab, Bash, ROS, GIS on Linux, OSX, Windows
· *Hardware*: embedded systems, sidescan/multibeam/rangefinding sonar, marine instrumentation and sensing, basic electronics
· *Data*: geospatial and time series data, image processing, sonar, navigation
· *Languages*: English (native), Spanish (basic), French (learning)

Presentations

· 2015: CapePy Python Meetup Tutorial: Introduction to Machine Learning with Scikit-learn
· 2015: SciPy 2015 Talk: Characterizing the Seafloor with Python as a Toolbox
· 2015: BRATS Talk: Standardizing Machine Learning Tasks with Scikit-learn

Workshops and Professional Development

· 2017: National Canadian Field Robotics Symposium and Field Trials
· 2016: Marine Robotics Summer School
· 2016: National Canadian Field Robotics Symposium and Field Trials
· 2013: Attendee SciPy: Scikit-learn, Cython, Geospatial Tutorials and Tracks
· 2013: Professional Course in Proposal Writing
· 2013: Professional Course in Promoting Research and Development
· 2012: Professional Course in Technical Writing
· 2012: Professional Course in Project Management
· 2010: NAUI Master Scuba Diver, Diving for Science Certified

Leadership and Volunteer Work

· 2015 Scikit-learn developer sprint in Paris
· 2015: Neural Information Processing Systems (NIPS), Volunteer
· 2015: Founder and Technical Organizer of WHOI-Software Technical Group
· 2015: CapePy Python Meetup Leader and Member
· 2014: Big-data, Robotics, Autonomy, Technology and Sensing (BRATS) Member
· 2013: South-Central CleanTech Open Incubator Judge, San Antonio and Austin TX

Selected Awards

· 2016: McGill GREAT Travel Award
· 2012: UTSA M.S. COE Valero Research Fellowship Offer
· 2013: Internal Research and Development Funding, Primary Investigator to implement a Low-Cost, Mobile Acoustic Sensor for Intelligent Search
· 2007: Terry Foundation Scholarship (Complete Undergraduate Tuition)
· 2007: Dick Walrath Foundation Scholarship
· 2007: American Quarter Horse Association Scholarship

EXPERIENCE

McGill University Jan 2016 - current
Graduate Researcher, Mobile Robotics Lab *Montreal, QC*

· Developed system for portable underwater localization using low-cost USBL/GPS components
· Worked on low-cost system for autonomous monitoring of marine environments
· Developed technique for calculating total iceberg volume using images captured above the waterline and sonar reflections below water

Woods Hole Oceanographic Institution (WHOI) Jan 2014 - Sept 2015
Software 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 all aspects of at-sea operations including deployments, hardware repair, and dive planning.
· Primary data scientist at-sea for geophysical, acoustic, and image processing.

· Developed automated spatio-temporal processing pipeline for high-resolution multibeam, sidescan sonar, and optical data maps.
· Assisted in overhaul of navigation (GPS/USBL/LBL/DR) processing and visualization.
· Developed user-interfaces (QT), vehicle control code (C++), data processing code (Python/Matlab), and device drivers primarily in Linux.

Southwest Research Institute (SwRI) Jan 2012 - Dec 2013
Engineer, Automation and Data Systems Division *San Antonio, TX*

· Software/Electrical Applied Research Engineer for research, commercial, and government clients.
· 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 for live acoustic data.
· Wrote beamforming calibration routine to tune for errors in sensor fabrication.

Lower Colorado River Authority (LCRA) Jan 2011 - Dec 2011
Engineering Coop, Telecommunications Department *Austin, TX*

· Designed and configured SONET, optical fiber, Ethernet, and microwave systems for critical communication infrastructure including power generation/distribution, dam and irrigation control, and emergency response coordination.
· Project lead for pilot irrigation control system using networked 900 MHz Radios.

Texas State University Jan 2010 - Dec 2010
Undergraduate Teaching and Lab Assistant *San Marcos, TX*

· Signals and Systems Teaching Assistant: Developed lecture presentations and provided grading
· Electronics Teaching Assistant: Developed lecture presentations and provided grading
· Microprocessors Lab Assistant: Provided support for assembly code development and debugging
· Engineering Management Teaching Assistant: Provided grading and study tutorials.

OCEANOGRAPHIC RESEARCH CRUISES

Mineral Exploration, Southeastern Pacific Jan 2014
R/V A'imikai-O-Kanoloa *Dr. Carl Kaiser*

· Learned AUV deployment, mission planning, data processing, and networking. Developed new initiative for robust data management.

Deep Water Supercoral in Low pH Environments, Gulf of Mexico Apr-May 2014
R/V Atlantis *Dr. Erik Cordes*

· Primary software/data engineer working with subsea navigation, scientific sensors, and images.

Iron Eaters of the Loihi Seamount, Hawaiian Islands June 2014
R/V Falkor *Dr. Brian Glazer*

· Primary software/data engineer working with subsea navigation, scientific sensors, and images. Developed thematic map of iron location in images for easy inspection and planning.

Juan de Fuca Ridge, Northeastern Pacific July 2014
R/V Atlantis *Dr. James Kinsey and Dr. Maurice Tivey*

· Lead software engineer for AUV optical communication system integration. Developed acoustic/optical search algorithm for finding an optical modem on the seafloor. Also provided navigation/data processing and visualization for science.

Monitoring Recovery of Pacific Seamounts, Hawaiian Islands Oct-Dec 2014
R/V Sikuliaq *Dr. Amy Baco-Taylor and Dr. Brendon Roark*

· Primary software/data engineer processing subsea navigation and images. Developed classifier for seafloor images for easier processing.

Mapping, Exploration, and Sampling at Havre Volcano, Southwestern Pacific Mar-Apr 2015
R/V Revelle *Dr. Adam Soule*

· Primary software/data processing engineer for Sentry AUV in collaboration with Jason ROV. Developed sidescan and sub-bottom pipeline for processing sonar signal using MB-System.

Studies of Evolution and Ecology of Petroleum Systems, Gulf of Mexico June 2015
R/V Atlantis *Dr. David Valentine*

· Primary software/data processing engineer for Sentry AUV working with multibeam, sidescan, and sub-bottom pipeline data.