Nick Hetherington, MASc

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Robotics Master's graduate experienced in prototyping and user interaction research with mobile robots.

EDUCATION

MASc in Mechanical Engineering (Human-Robot Interaction) Aug. 2020
University of British Columbia Vancouver, BC

- Thesis: "Design and evaluation of nonverbal motion cues for human-robot spatial interaction"
- First Class Standing (88% avg.); NSERC scholarship ($17,500); BC Government Scholarship ($15,000)
- 2 technical teaching assistant positions (C#, MatLab, Arduino, SolidWorks)

BASc in Electrical Engineering (Robotics, Systems, and Control) May 2017
Queen's University Kingston, ON

- First Class Honours (87% avg.); Chancellor's entrance scholarship ($36,000)
- 1 technical teaching assistant position (RobotC for LEGO NXT robots)

ENGINEERING EXPERIENCE

Nonverbal Communication Cues for Mobile Robots Sept. 2018 - Aug. 2020
Master's Research Project, University of British Columbia Vancouver, BC

- Designed light-based and motion-based cues for a mobile robot to communicate with pedestrians
- Integrated the cues with the ROS Navigation Stack for autonomous motion (C++)
- Conducted two user studies to evaluate the cues' social acceptability
- Presented a workshop poster at IEEE ICRA 2019 (1st author)

Voice Recognition System for Mobile Robot Oct. - Nov. 2019
Internship, JDQ Systems Vancouver, BC

- Adapted a ROS interface with the MS Azure Speaker Recognition API for a new microphone (Python)

Pedestrian Following for Autonomous Navigation with Mobile Robot May - Aug. 2018
Master's Research Project, University of British Columbia Vancouver, BC

- Co-designed a person-following method for a mobile robot to navigate sidewalks
- Integrated a learned multi-agent collision avoidance policy with the ROS Navigation Stack (Python)
- Presented a poster and paper at IEEE ICRA 2019 (2nd author)

UAV Indoor Guidance System Apr. 2015 - Apr. 2017
Undergraduate Capstone Project, Queen's University Kingston, ON

- Co-designed and implemented a system for a quadrotor to follow walls using SONAR (ROS/ Python /C++)
- Placed 3rd, 2017 IEEE Eastern Ontario Student Paper Competition

Industrial Automation Systems Designer Sept. 2015 - July 2016
Internship, Grantek Systems Integration Richmond, BC

- Implemented process and supervisory control systems for manufacturing lines (ladder logic, VBA)
- Programmed PLCs and GUIs, commissioned automation systems, and trained operators

Electrical Design Lead & Project Manager May 2014 - Jun. 2015
Robotic Sailboat Design Team, Queen's University Kingston, ON

- Designed and implemented the electrical systems for a 2 m robotic sailboat (Arduino/C++)
- Integrated IMUs, GPS, and weather sensors, motor controllers, and radio control; designed custom PCBs
- Placed 2nd, 2015 International Robotic Sailing Regatta (St. John's, NL)

Intuitive Hand Control of Robot Arm Jan. - Apr. 2015
Undergraduate Course Project, Queen's University Kingston, ON
- Mounted an accelerometer and a force sensor on a glove, integrated with a 3 DOF servo arm and gripper
- Enabled user control of the servo arm with hand movement (Arduino/C++)

Pick and Place with Robot Arm on Mobile Base Jan. - Apr. 2014
Undergraduate Course Project, Queen's University Kingston, ON
- Integrated light/force sensors, and motor/servo controllers for a pick and place competition (Arduino/C++)

Mine Sweeping with Robot Arm on Mobile Base Sept. 2013 - Apr. 2014
Undergraduate Course Project, Queen's University Kingston, ON
- Integrated light/force/magnetic sensors, and motor/servo controllers to pick up fake mines (Arduino/C++)

Playing Tag with Mobile Robots Sept. 2012 - Apr. 2013
Undergraduate Course Project, Queen's University Kingston, ON
- Integrated light/sound/touch sensors with motor controllers to make 2 robots play tag (RobotC)

SKILLS

Programming:
- Proficient in: C++ 11; Python 2.7
- Experience with: C; C# 7; Java 8; MatLab 18; Bash
- Robot Operating System (Kinetic): Navigation Stack; detecting people and AR/QR tags; custom packages
- Object-oriented design; distributed/parallel systems

Other:
- Embedded systems design with custom PCBs; sensor/actuator integration with Arduino; soldering/wiring
- Version control (Git)
- Linux (Ubuntu 16/18)
- Human-centred design; design of user studies and quantitative experiments
- Statistical data analysis and visualization (R; Python)

LEADERSHIP EXPERIENCE

Class President | Council Speaker | Board of Directors Sept. 2012 - Apr. 2017
Queen's University Engineering Society (elected extra-curricular positions) Kingston, ON
- Chaired a committee of 15 organizing events for 670 peers
- Chaired council meetings of 30 peers representing 2500 constituents
- Sat on the advisory board of the not-for-profit Queen's Campus Bookstore
- Received three service awards from peers

Director of Outripping | Leadership Development Counsellor | Specialty Counsellor 2011 - 2017
YMCA Camp Elphinstone (volunteer and paid) Gibsons, BC
- Organized overnight canoeing and hiking trips; managed 3 guides; co-managed 100 staff
- Designed and led two 28-day leadership development programs for teens
- Worked with campers with invisible disabilities; HIV/AIDS; type-1 diabetes
- Received two awards from management

Adaptive Ski Instructor | Mountaineering Instructor May 2019 - present
Vancouver Adaptive Snow Sports | UBC Varsity Outdoor Club (volunteer) Vancouver, BC
- Teach skiing techniques to students with disabilities
- Teach rock climbing and glacier travel skills to club members