Stewart C. Jamieson

PhD Student · Autonomous Robots & Machine Learning

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A roboticist working to invent autonomous systems that co-operate with humans in uncertain, unstructured, and unknown environments and accomplish their objectives safely and efficiently.

Education

Massachusetts Institute of Technology & Woods Hole Oceanographic Institution — *Cambridge, MA, USA*

Ph.D. in Applied Ocean Science and Engineering — Marine Robotics — *June 2020 - Present*

- Co-supervised by Dr. Yogesh Girdhar (WHOI) and Prof. Jonathan P. How (MIT)
- Developing multi-robot systems that collaboratively explore remote, unfamiliar environments with limited human guidance

S.M. in Aeronautics and Astronautics — Autonomous Systems (5.0/5.0 CGPA) — *June 2018 - May 2020*

- Thesis: *Enabling Human-Robot Cooperation in Scientific Exploration of Bandwidth-Limited Environments*
- Co-supervised by Dr. Yogesh Girdhar (WHOI) and Prof. Jonathan P. How (MIT)
- Relevant Coursework: Cognitive Robotics, Visual Navigation for Autonomous Vehicles, Bayesian Modelling and Inference

University of Toronto — *Toronto, ON, Canada*

B.A.Sc. in Engineering Science with Honours — Robotics Major (3.83/4.0 CGPA) — *Sept. 2013 - Apr. 2018*

Thesis: *Deep Learning for Robust Vision in Realtime Autonomous Driving*, supervised by Prof. Angela Schoellig

Work & Research Experience

WHOI's Autonomous Robotics and Perception Laboratory (WARPLab) — *Woods Hole, MA, USA*

Graduate Research Assistant — *June 2018 - Present*

- Developing autonomous exploration algorithms for multi-robot teams exploring the deep ocean and coral reefs
- Publications focus on enabling robot co-operation with humans over very limited communication channels
- Assisting with the deployment of these novel algorithms into WHOI's world-class deep sea exploration vehicles (e.g. Sentry)

aUToronto Self-Driving Car Team — *Toronto, ON, Canada*

Software Team Lead — *June 2017 - June 2018*

- Led a subteam of 12 graduate and undergraduate students working to develop an autonomous Chevrolet Bolt
- My team created the overall system software architecture, sensor drivers, vehicle control interface, and software services
- At the end of my term as lead, aUToronto won 1st place in Year One of the SAE/GM AutoDrive Challenge

Zebra Technologies Inc. — *Mississauga, ON, Canada*

Software Engineering Intern, Engineering Product Innovation Team — *May 2016 - Aug. 2017*

- Co-designed and co-developed the software of the first Zebra SmartSight™ prototype, a robot designed for retail operations
- Helped to research and present business applications for robotics, machine learning, and neural networks
- 16 months of C++14 development experience including networking, data processing, and multithreaded computing

Wattpad Inc. — *Toronto, ON, Canada*

Android Software Developer, Reader Acquisition Team — *May 2015 - Sept. 2015*

- Wattpad is a worldwide storytelling platform with a community of over 80 million users
- Implemented features designed to attract new users; also implemented A/B tests to validate each features' success

QA Software Developer, Android Core Team — *May 2014 - Sept. 2014*

- Searched for, reported, and fixed software bugs in the Android mobile application with over 15 million users
- Designed and implemented a virtual doorman to greet company visitors and notify staff of their arrival

Professional Activities

Zebra Technologies Inc. *Mississauga, ON, Canada*

Editor, EMC Innovation Newsletter *May 2016 - Aug. 2017*

- Edited bi-monthly department newsletter and distributed it to over 1700 engineers
- Commissioned, reviewed, and published articles about recent trends and innovations in electronics, robotics, etc.

Graduate Student Member *Worldwide*

IEEE (Institute of Electrical and Electronics Engineers) *Nov. 2013 - Present*

Peer-Reviewed Publications

Jamieson, S., How, J.P., Girdhar, Y. (2020). *Active Reward Learning for Co-Robotic Vision Based Exploration in Bandwidth Limited Environments.* In IEEE International Conference on Robotics and Automation (ICRA). Paris, France. **Won Best Paper Award in Service Robotics.**

Girdhar, Y., Cai, L., **Jamieson, S.**, McGuire, N., Flaspohler, G., Suman, S., & Claus, B. (2019). *Enabling Co-Robotic Scientific Exploration of Unknown Environments over a Low Bandwidth Communication Channel.* In IEEE International Conference on Robotics and Automation (ICRA). Montréal, Canada.

Jamieson, S. (2019). *The Pervasiveness of Deep Learning in Robotics Research Does Not Impede Scientific Insights into Robotics Problems.* In "Debates on the Future of Robotics Research" Workshop at ICRA 2019. Montréal, Canada.

Other Publications

Beaulieu, S., Alexander, H., **Jamieson, S.**, Longworth, B., McLean, C., Soenen, K., York, A., Krinos, A., Cai, L., Govostes, R. and Hernandez, C. (2020). *Building a data science curriculum and community for ocean scientists, engineers, and students using The Carpentries model.* In AGU Fall Meeting 2020.

Jamieson, S. (2020). *Enabling Human-Robot Cooperation in Scientific Exploration of Bandwidth-Limited Environments.* Master's Thesis, Massachusetts Institute of Technology & Woods Hole Oceanographic Institution.

Jamieson, S. (2018). *Deep Learning for Robust Vision in Realtime Autonomous Driving.* B.A.Sc. Thesis, University of Toronto.

Presentations

Videos and other materials used in some of the following presentations are available at www.stewartjamieson.com

Human-Robot Cooperation for Exploring Bandwidth-Limited Environments *Woods Hole, MA, USA*

Invited Presenter, AOPE Department Seminar Series *July 2020*

Deep Learning Does Not Impede Scientific Insights into Robotics Problems *Montréal, QC, Canada*

Invited Lightning Talk, Debates on the Future of Robotics Research, ICRA 2019 *May 2019*

- Argued deep learning is a tool, not an obstacle, for making scientific insights into robotics problems. See IEEE RA-M Paper.

16.412 Lecture: Multi-Robot Adaptive Sampling *Cambridge, MA, USA*

Co-Lecturer, Massachusetts Institute of Technology *Apr. 2019*

An Introduction to Neural Networks and Machine Learning *Mississauga, ON, Canada*

Lead Presenter for Zebra Technologies Inc. "Lunch & Learn" *Jan. 2017*

- Introduced the key concepts of neural networks & machine learning to over 200 engineers and shared results of research investigation into relevant business applications of neural networks

Should Robots Have Rights? *Toronto, ON, Canada*

Co-Presenter in Debate at the University of Toronto *Dec. 2015*

- Argued that sufficiently "intelligent" robots of the future should be awarded basic rights

A Customized Graphical Checklist for Efficient Ambulance Inventory *Toronto, ON, Canada*

Co-Presenter in "Praxis II Showcase" at the University of Toronto *Apr. 2014*

- Developed a low-cost, computer-generated checklist to improve efficiency for resupplying ambulance inventory and presented results to attending professors, paramedics, and CBC Radio

Honors & Awards

International

2020	**Best Paper Award in Service Robotics (out of 1483 Accepted Papers)**, ICRA 2020	*Paris, France*
2018	**1st Place Team**, SAE/GM AutoDrive Challenge	*Yuma, AZ, USA*

Domestic

2018	**Dean's Honour List**, University of Toronto	*Toronto, ON, Canada*
2014-16	**Dean's Honour List (x3)**, University of Toronto	*Toronto, ON, Canada*
2013	**Governor General's Bronze Medal for Academic Excellence**, High School Graduation	*Burlington, ON, Canada*
2013	**Regional Champion**, ECOO Programming Competition	*Halton, ON, Canada*
2010-13	**School Champion (x4)**, Waterloo CEMC Math Contest	*Burlington, ON, Canada*

Research Interests & Skills

Artificial Intelligence	Topic Modelling, Deep Learning for Robust Vision, Active Learning, Unsupervised Learning, AI Ethics
Robotics	Autonomous Scientific Exploration, Human-Robot Interaction, Informative Path Planning
Programming	C++17, Python, ROS, OpenCV, Java, MATLAB, Pandas, Android

Teaching

The Carpentries — *Worldwide*

Certified Software Carpentries Instructor — *Oct. 2020 - Present*

- Oct. 2020: Helper for WHOI Data Carpentry Workshop
- July 2020: Co-Instructor for WHOI Python Workshop Series
- Oct. 2019: Helper for WHOI Software Carpentry Workshop

Service Activities

Professional Service — *Worldwide*

Editorial Roles — *Nov. 2019 - Present*

- Reviewed Conference Submissions for:
  - International Conference on Machine Learning (ICML)
  - International Conference on Robotics and Automation (ICRA)
  - International Conference on Intelligent Robots and Systems (IROS)
- Reviewed Journal Submissions for:
  - Robotics and Automation Letters (RA-L)
  - Journal of Aerospace Information Systems (JAIS)

Personal Interests

Corpus Christi Jazz Horns and Concert Band — *Burlington, ON, Canada*

Saxophonist — *Sept. 2009 - June 2013*

- Performed in the Atlantic Music Festival (2013), Toronto Music Festival (2012)