

Stewart C. Jamieson

PHD STUDENT · AUTONOMOUS ROBOTS & MACHINE LEARNING

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

Research Interests & Skills

Artificial Intelligence Online & Active Learning, Unsupervised Learning, Robust Vision, Spatiotemporal Topic Modelling, AI Ethics
Robotics Goal-Directed Exploration, Human-Robot Interaction, Uncertainty Quantification, Informative Path Planning
Programming C++20, Python, PyTorch, TensorFlow, ROS, OpenCV, Pandas, MATLAB, Bash, Java, Android

Education

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

PH.D. IN APPLIED OCEAN SCIENCE AND ENGINEERING — MARINE ROBOTICS (5.0/5.0 CGPA) *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
- Applied state-of-the-art uncertainty quantification techniques to achieve safer autonomous driving performance

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 slow, bandwidth-limited communication channels
- Assisting with the deployment of these novel algorithms into WHOI's world-class deep sea exploration vehicles

aUToronto Self-Driving Car Team (SAE/GM AutoDrive Challenge) *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, databases, and high performance 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

Publications

PEER-REVIEWED CONFERENCE PAPERS

Jamieson, S., Fathian, K., Khosoussi, K., How, J. P., Girdhar, Y. (2021). *Multi-Robot Distributed Semantic Mapping in Unfamiliar Environments through Online Matching of Learned Representations*. In 2021 IEEE International Conference on Robotics and Automation (ICRA). Xi'an, China.

Jamieson, S., How, J. P., Girdhar, Y. (2020). *Active Reward Learning for Co-Robotic Vision Based Exploration in Bandwidth Limited Environments*. In 2020 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 2019 IEEE International Conference on Robotics and Automation (ICRA). Montréal, Canada.

WORKSHOP PAPERS

Jamieson, S., Todd, J. E., How, J. P., Girdhar, Y. (2021). *Communicating Efficiently to Enable Human-Multi-Robot Collaboration in Space Exploration*. In "SpaceCHI: Human-Computer Interaction for Space Exploration" Workshop at CHI 2021. Yokohama, Japan.

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. (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.

THESES

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.

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](#)

Presentations

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

Communicating Efficiently to Enable Human-Multi-Robot Collaboration in Space Exploration [Online](#)

POSTER PRESENTATION, SPACECHI WORKSHOP @ CHI 2021 [May 2021](#)

Human-Robot Cooperation for Exploring Bandwidth-Limited Environments [Woods Hole, MA, USA](#)

INVITED TALK, WHOI APOE DEPARTMENT SEMINAR SERIES [July 2020](#)

Active Reward Learning for Co-Robotic Exploration in Bandwidth-Limited Environments [Cambridge, MA, USA](#)

INVITED PRESENTER & PANELIST, ICRAxMIT [June 2020](#)

Deep Learning Does Not Impede Scientific Insights into Robotics Problems

INVITED LIGHTNING TALK, DEBATES ON THE FUTURE OF ROBOTICS RESEARCH, ICRA 2019

Montréal, QC, Canada

May 2019

16.412 Lecture: Multi-Robot Adaptive Sampling

CO-LECTURER, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Cambridge, MA, USA

Apr. 2019

An Introduction to Neural Networks and Machine Learning

LEAD PRESENTER FOR ZEBRA TECHNOLOGIES INC. "LUNCH & LEARN" (200+ ATTENDEES)

Mississauga, ON, Canada

Jan. 2017

Should Robots Have Rights?

CO-PRESENTER IN DEBATE AT THE UNIVERSITY OF TORONTO

Toronto, ON, Canada

Dec. 2015

A Customized Graphical Checklist for Efficient Ambulance Inventory

CO-PRESENTER IN "PRAXIS II SHOWCASE" AT THE UNIVERSITY OF TORONTO

Toronto, ON, Canada

Apr. 2014

Teaching

Massachusetts Institute of Technology

TEACHING ASSISTANT

- Fall 2020: 16.485 Visual Navigation for Autonomous Vehicles (Prof. Luca Carlone)

Worldwide

Aug. 2020 - Dec. 2020

The Carpentries

CERTIFIED SOFTWARE CARPENTRIES INSTRUCTOR

- June 2021: Co-Instructor for WHOI Student Python Workshop Series 2021
- Oct. 2020: Helper for WHOI Data Carpentry Workshop Fall 2020
- July 2020: Co-Instructor for WHOI Student Python Workshop Series 2020
- Oct. 2019: Helper for WHOI Software Carpentry Workshop Fall 2019

Worldwide

Oct. 2019 - Present

Academic Service

- Organizer of:
 - AI for Earth & Space Science Workshop @ ICLR 2022
- Reviewed Journal Submissions for:
 - Robotics and Automation Letters (RA-L)
 - Journal of Aerospace Information Systems (JAIS)
- 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)

Professional Service

MIT-WHOI Joint Program

ELECTED AT-LARGE REPRESENTATIVE

- Co-hosted monthly online student events to maintain social cohesion during worldwide pandemic
- Developed and published the MIT-WHOI Joint Program online photoboard

Woods Hole, MA, USA

Oct. 2020 - Oct. 2021

Zebra Technologies Inc.

EDITOR, EMC INNOVATION NEWSLETTER

- 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.

Mississauga, ON, Canada

May 2016 - Aug. 2017

Graduate Student Member

IEEE (INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS)

Worldwide

Nov. 2013 - Present

Personal Interests

Corpus Christi Jazz Horns and Concert Band

SAXOPHONIST

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

Burlington, ON, Canada

Sept. 2009 - June 2013