

# Stewart C. Jamieson

PHD CANDIDATE · RISK-AWARE AI & ROBOTICS

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*A roboticist developing autonomous systems that can use human-robot interactions to safely and efficiently accomplish their objectives when faced with unfamiliar, unstructured, or dynamic environments.*

## Research Interests & Skills

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**Artificial Intelligence** Risk-Aware Online Learning, Bayesian Modelling & Inference, Reinforcement Learning, AI Ethics  
**Robotics** Human-Robot Collaboration, 3-D Semantic Mapping, Robust Vision, Informative Path Planning  
**Programming** Python 3, C++20, PyTorch, ROS, OpenCV, MATLAB, Mathematica, Android/Java

## Education

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

PH.D. IN AERONAUTICS AND ASTRONAUTICS — AUTONOMOUS SYSTEMS MAJOR (5.0/5.0 CGPA) June 2020 - Present

- Working Thesis Title: *Federated Human-Multi-Robot Learning and Coordination in Bandwidth-Limited Environments*
- Developing autonomous robots to explore remote environments with efficient human-robot/robot-robot interactions
- Co-supervised by Prof. Jonathan P. How (MIT) and Dr. Yogesh Girdhar (WHOI)

S.M. IN AERONAUTICS AND ASTRONAUTICS — AUTONOMOUS SYSTEMS MAJOR (5.0/5.0 CGPA) June 2018 - May 2020

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

### 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

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### 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 optimizing robot-human collaboration in challenging communication environments
- Assisting with the deployment of these novel algorithms into WHOI's world-class deep sea exploration vehicles

### aUToronto: The University of Toronto's Self-Driving Car Team Toronto, ON, Canada

SOFTWARE SUB-TEAM LEAD June 2017 - June 2018

- Led a sub-team of 12 graduate and undergraduate students in a competition 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, aUToronto won **1st place in the SAE/GM AutoDrive Challenge (Year 1)**

### Zebra Technologies Inc. Mississauga, ON, Canada

SOFTWARE ENGINEERING INTERN, ENGINEERING PRODUCT INNOVATION TEAM May 2016 - Aug. 2017

- Co-designed and co-developed core software for the first Zebra SmartSight™ robot prototype
- Researched and presented 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 INTERN, READER ACQUISITION TEAM May 2015 - Sept. 2015

- Implemented features designed to attract new users to Wattpad, a worldwide storytelling platform
- Used A/B testing to validate features before releasing to a community of over 80 million users

- Searched for, reported, and fixed software bugs in the Wattpad Android application which had over 15 million users
- Personally designed and implemented a virtual doorman to greet company visitors and notify staff of their arrival

## Publications

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### PEER-REVIEWED CONFERENCE PAPERS

**Jamieson, S.**, How, J. P., & Girdhar, Y. (2023). *DeepSeeColor: Realtime Adaptive Color Correction for Autonomous Underwater Vehicles via Deep Learning Methods*. In 2023 IEEE International Conference on Robotics and Automation (ICRA). London, UK.

Girdhar, Y., McGuire, N., Cai, L., **Jamieson, S.**, McCammon, S., San Soucie, J. E., Todd, J. E., Claus, B., & Mooney, T. A. (2023). *CUREE: A Curious Underwater Robot for Ecosystem Exploration*. In 2023 IEEE International Conference on Robotics and Automation (ICRA). London, UK.

**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

Yang, D., Cai, L., **Jamieson, S.**, & Girdhar, Y. (2023). *Robot Goes Fishing: Rapid, High-Resolution Biological Hotspot Mapping in Coral Reefs with Vision-Guided Autonomous Underwater Vehicles*. In "CV4Animals" Workshop at CVPR 2023. Vancouver, Canada.

**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

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### 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](#)

## ACADEMIC

2013	<b>Governor General's Bronze Medal for Academic Excellence</b> , Corpus Christi Secondary School	<i>Burlington, Canada</i>
2013	<b>Regional Champion</b> , ECOO Programming Competition	<i>Halton Region, Canada</i>
2010-13	<b>School Champion (x4)</b> , Waterloo CEMC Math Contest	<i>Burlington, Canada</i>

## Presentations

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Videos and other materials used in some of the following presentations are available at [www.stewartjamieson.com](http://www.stewartjamieson.com)

<b>ROBOTS: How new technologies are advancing ocean research, exploration, and science-based solutions</b>	<i>Online</i>
PRESENTER, WHOI OCEAN ENCOUNTERS (SEASON 5 EPISODE 4)	<i>May 2023</i>
<b>Multi-Robot Reef Monitoring, Mapping, &amp; Human-Guided Exploration</b>	<i>Online</i>
INVITED TALK, NCCOS SfM/AI WORKING GROUP	<i>March 2023</i>
<b>Rapid, Comprehensive Coral Reef Monitoring with AUVs</b>	<i>Bremen, Germany</i>
INVITED TALK, 15TH INTERNATIONAL CORAL REEF SYMPOSIUM	<i>July 2022</i>
<b>Communicating Efficiently to Enable Human-Multi-Robot Collaboration</b>	<i>Online</i>
POSTER PRESENTATION, SPACECHI WORKSHOP @ CHI 2021	<i>May 2021</i>
<b>Human-Robot Cooperation for Exploring Bandwidth-Limited Environments</b>	<i>Woods Hole, MA, USA</i>
INVITED TALK, WHOI AOPE DEPARTMENT SEMINAR SERIES	<i>July 2020</i>
<b>Active Reward Learning for Co-Robotic Exploration in Bandwidth-Limited Environments</b>	<i>Cambridge, MA, USA</i>
INVITED PRESENTER & PANELIST, ICRAxMIT	<i>June 2020</i>
<b>Deep Learning Does Not Impede Scientific Insights into Robotics Problems</b>	<i>Montréal, QC, Canada</i>
INVITED LIGHTNING TALK, DEBATES ON THE FUTURE OF ROBOTICS RESEARCH, ICRA 2019	<i>May 2019</i>
<b>16.412 Lecture: Multi-Robot Adaptive Sampling</b>	<i>Cambridge, MA, USA</i>
CO-LECTURER, MASSACHUSETTS INSTITUTE OF TECHNOLOGY	<i>Apr. 2019</i>
<b>An Introduction to Neural Networks and Machine Learning</b>	<i>Mississauga, ON, Canada</i>
LEAD PRESENTER FOR ZEBRA TECHNOLOGIES INC. "LUNCH & LEARN" (200+ ATTENDEES)	<i>Jan. 2017</i>
<b>Should Robots Have Rights?</b>	<i>Toronto, ON, Canada</i>
CO-PRESENTER IN DEBATE AT THE UNIVERSITY OF TORONTO	<i>Dec. 2015</i>
<b>A Customized Graphical Checklist for Efficient Ambulance Inventory</b>	<i>Toronto, ON, Canada</i>
CO-PRESENTER IN "PRAXIS II SHOWCASE" AT THE UNIVERSITY OF TORONTO	<i>Apr. 2014</i>

## Teaching

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<b>The Carpentries</b>	<i>Worldwide</i>
CERTIFIED SOFTWARE CARPENTRIES INSTRUCTOR	<i>Oct. 2019 - Present</i>
<ul style="list-style-type: none"><li>• June 2021: Co-Instructor for the WHOI Student Python Workshop Series 2021</li><li>• Oct. 2020: Helper for the WHOI Data Carpentry Workshop Fall 2020</li><li>• July 2020: Co-Instructor for the WHOI Student Python Workshop Series 2020</li><li>• Oct. 2019: Helper for the WHOI Software Carpentry Workshop Fall 2019</li></ul>	
<b>Massachusetts Institute of Technology</b>	<i>Worldwide</i>
TEACHING ASSISTANT	<i>Aug. 2020 - Dec. 2020</i>
<ul style="list-style-type: none"><li>• Fall 2020: 16.485 Visual Navigation for Autonomous Vehicles (Lead Instructor: Prof. Luca Carlone)</li></ul>	

## Academic Service

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- Co-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 Learning Representations (ICLR)

- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Machine Learning (ICML)
- International Conference on Robotics and Automation (ICRA)
- International Conference on Intelligent Robots and Systems (IROS)

## Professional Service

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### MIT-WHOI Joint Program

*Woods Hole, MA, USA*

ELECTED AT-LARGE REPRESENTATIVE

*Oct. 2020 - Oct. 2021*

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

### 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*

## Personal Interests

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### 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)