

TREVOR ABLETT

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EDUCATION

- Ph.D** (in progress), University of Toronto, Toronto, Ontario 2017 - Present
Institute for Aerospace Studies, Space and Terrestrial Autonomous Robotics Systems Lab
Topic: Addressing the Limitations of Imitation Learning in Robotic Manipulators
Supervisor: Dr. Jonathan Kelly.
Overall GPA: 4.0/4.0
- M.A.Sc.** (Transferred to PhD), University of Toronto, Toronto, Ontario 2016 - 2017
Institute for Aerospace Studies, Space and Terrestrial Autonomous Robotics Systems Lab
Topic: Active Calibration of a Mobile Manipulator
Supervisor: Dr. Jonathan Kelly.
Overall GPA: 4.0/4.0
- B.Eng., Mechatronics**, McMaster University, Hamilton, Ontario 2011 - 2015
Faculty of Engineering, Dept. of Computing and Science
Summa cum laude, Overall GPA: 3.9/4.0
- B.A., Psychology**, McMaster University, Hamilton, Ontario 2009 - 2015
Faculty of Social Sciences, Dept. of Psychology, Neuroscience and Behaviour
Summa cum laude, Overall GPA: 3.9/4.0

PUBLICATIONS

1. O. Limoyo, **T. Ablett**, and J. Kelly, “Learning Sequential Latent Variable Models from Multimodal Time Series Data,” in *Proceedings of the 17th International Conference on Intelligent Autonomous Systems (IAS)*, Zagreb, Croatia, Jun. 13–17 2022, **Finalist for the Best Paper Award**
2. **T. Ablett***, B. Chan*, and J. Kelly, “Learning from Guided Play: A Scheduled Hierarchical Approach for Improving Exploration in Adversarial Imitation Learning,” in *Proceedings of the Neural Information Processing Systems (NeurIPS’21) Deep Reinforcement Learning Workshop*, Dec. 13 2021
3. **T. Ablett**, Y. Zhai, and J. Kelly, “Seeing All the Angles: Learning Multiview Manipulation Policies for Contact-Rich Tasks from Demonstrations,” in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS’21)*, Prague, Czech Republic, Sept. 2021
4. F. Maric, O. Limoyo, L. Petrovic, **T. Ablett**, I. Petrovic, and J. Kelly, “Fast Manipulability Maximization Using Continuous-Time Trajectory Optimization,” in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS’19)*, Macau, China, Nov. 4–8 2019

5. O. Limoyo, **T. L. Ablett**, F. Marić, L. Volpatti, and J. Kelly, “Self-Calibration of Mobile Manipulator Kinematic and Sensor Extrinsic Parameters Through Contact-Based Interaction,” in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA’18)*, Brisbane, Queensland, Australia, May 2018

TECHNICAL REPORTS

1. **T. Ablett**, F. Marić, and J. Kelly, “Fighting Failures with FIRE: Failure Identification to Reduce Expert Burden in Intervention-Based Learning,” *arXiv:2007.00245*, 2020

PATENTS

1. J. Kelly, O. Limoyo, and **T. Ablett**, “Method of Calibrating a Mobile Manipulator,” no. WO/2019/165561, International App. No. PCT/CA2019/050252, 2019
2. R. Peters, C. V. Tran, **T. L. Ablett**, L. J. Lepore, and M. J. Sergenese, “Vision-based System for Navigating a Robot Through an Indoor Space,” no. WO2017066870A1, 2017

AWARDS

- | | |
|--|---|
| Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)
<i>University of Toronto</i> | September 2020 - August 2021
<i>Toronto, ON</i> |
| · \$5000 per semester, \$15000 total. | |
| Ontario Graduate Scholarship (OGS)
<i>University of Toronto</i> | September 2019 - August 2020
<i>Toronto, ON</i> |
| · \$5000 per semester, \$15000 total. | |
| Kenneth M. Molson Fellowship
<i>University of Toronto</i> | October 2019
<i>Toronto, ON</i> |
| · \$2500. | |
| Ontario Graduate Scholarship (OGS)
<i>University of Toronto</i> | September 2018 - August 2019
<i>Toronto, ON</i> |
| · \$5000 per semester, \$15000 total. | |
| Douglas Patton Hogg Memorial Award
<i>University of Toronto</i> | December 2018
<i>Toronto, ON</i> |
| · \$2531. | |
| Ontario Graduate Scholarship (OGS)
<i>University of Toronto</i> | September 2017 - April 2018
<i>Toronto, ON</i> |
| · \$5000 per semester, \$10000 total. | |
| University (Senate) Scholarship
<i>McMaster University</i> | September 2013 - August 2014
<i>Hamilton, ON</i> |
| · \$800. | |
| McMaster Honour Award, Level 3
<i>McMaster University</i> | September 2009 - August 2011
<i>Hamilton, ON</i> |
| · \$2000 per year, \$4000 total. | |

TEACHING EXPERIENCE

University of Toronto

Teaching Assistant

Winter 2018-Present

Toronto, ON

Course Title: AER521 - Mobile Robotics

- Robotics course with both undergraduate and graduate level students
- Developed, administered, and graded MATLAB/ROS robotics laboratories

Coursera.org and University of Toronto

Subject Matter Expert

October 2018 - April 2019

Toronto, ON

Course Title: Self-Driving Car Specialization

- Developing code, assignments and other supplementary material for a course on state estimation of self-driving cars.
- Assignments are on sensor fusion using filtering techniques, point cloud matching, and 3D geometry.

University of Toronto

Teaching Assistant

Winter 2018

Toronto, ON

Course Title: APS106 - Fundamentals of Computer Programming

- First year programming course using Python
- Administered weekly programming laboratories to students and aided in ongoing development of course

University of Toronto

Teaching Assistant

Fall 2016

Toronto, ON

Course Title: ROB501 - Computer Vision for Robotics

- Course with both undergraduate and graduate level students
- Administered MATLAB and computer vision tutorials
- Aided in development and marking of MATLAB based computer vision assignments

McMaster University

Teaching Assistant

Winter 2015

Hamilton, ON

Course Title: Software Engineering 2DA4 - Digital Systems and Interfacing

- Administered labs using Verilog HDL and Altera based FPGAs

McMaster University

Teaching Assistant

Fall 2014

Hamilton, ON

Course Title: Software Engineering 3I03 - Communications Skills

- Created presentation materials for tutorials on giving software engineering presentations
- Ran weekly mandatory tutorials for 30 students

WORK EXPERIENCE

Callisto Mechanical

Controls Engineer in Training

April 2015 - June 2016

Niagara-on-the-Lake, ON

- Management and execution of research based projects in vision, robotics, and controls
- Named on pending patent for a vision-based Automated Guided Vehicle
- Development of software based controls, HMIs, and SCADA for OEM machines to be used in process automation
- Worked with various software and hardware tools, including Java and C++ based embedded systems, PLCs, and HMIs
- Attended numerous sites for commissioning of various machines and software systems

Self Employed – University Level Private Tutor

September 2013 - April 2015

Introductory Level Programming

Hamilton, ON

- Charged a small fee for private tutoring sessions in an introductory level programming class where assignments were completed using Python.

Callisto Integration

May 2014 - August 2014

Controls Engineer in Training

Hamilton, ON

- Lead designer of HMI for a Solar Farm
- PLC programming and debugging of existing systems

Venture Engineering and Science Camp

May 2013 - April 2014

Computer/Technology/Robotics Instructor

Hamilton, ON

- Designed various electronics, computer, and robotics projects for elementary school aged children

VOLUNTEER EXPERIENCE

Bay Area Science and Engineering Fair (BASEF)

January 2017 - April 2017

Team Mentor

Burlington, ON

- Provided weekly assistance and advice to an elementary school science fair team

Industry Education Council of Hamilton

January 2015 - June 2015

Code Club - Instructor

Hamilton, ON

- Ran a lunchtime club for elementary school students to learn programming through simple projects

MEDIA APPEARANCES

Ridgeback Helping to Solve Challenging Mobile Manipulation Tasks

Nov 18, 2020

Clearpath Robotics

Clearpath Robotics wrote a blog post showcasing our lab and our mobile manipulation platform, including a video generated as part of a project of mine in which I used end-to-end policies to complete difficult tasks regardless of viewpoint. [\[Blog post\]](#) [\[Video only\]](#)

Ontario Centres of Excellence (OCE) Showcase – Demo

Aired May 17, 2017

China Central Television

CCTV-13, the Chinese national news channel, included a short segment in their daily broadcast with video of me teleoperating our mobile manipulator platform. [\[Online news brief \(Chinese\)\]](#)

TECHNICAL STRENGTHS

Programming Languages

Python, C++, C, Java, MATLAB, LaTeX, Verilog, Ladder Logic

Frameworks/Libraries

numpy, scipy, tensorflow, pytorch, ROS, OpenCV, scikit-learn

Hardware

Arduino, Raspberry Pi, PIC microcontroller, various actuators and sensors

Tools

Linux (CLI), Windows, MS Office, Git, SVN