

# TREVOR ABLETT

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## EDUCATION

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**Ph.D** (in progress), University of Toronto, Toronto, Ontario 2017 - Present  
Institute for Aerospace Studies, Space and Terrestrial Autonomous Robotics Systems Lab  
*Topic:* Addressing Distribution Shift in Robotic Imitation Learning  
*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

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### Papers

- [1] **T. Ablett**, B. Chan, J. H. Wang, and J. Kelly, “Efficient Imitation Without Demonstrations via Value-Penalized Auxiliary Control from Examples,” in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA ’25)* [submitted], 2025, <https://papers.starslab.ca/vpace/>.
- [2] **T. Ablett**, O. Limoyo, A. Sigal, A. Jilani, J. Kelly, K. Siddiqi, F. Hogan, and G. Dudek, “Multimodal and Force-Matched Imitation Learning with a See-Through Visuotactile Sensor,” *IEEE Transactions on Robotics (T-RO): Special Section on Tactile Robotics [to appear]*, January 2025, <https://papers.starslab.ca/sts-il/>.
- [3] **T. Ablett**, B. Chan, J. H. Wang, and J. Kelly, “Fast Reinforcement Learning without Rewards or Demonstrations via Auxiliary Task Examples,” in *Conference on Robot Learning (CoRL’24) Workshop on Mastering Robot Manipulation in a World of Abundant Data*, Nov. 2024, <https://papers.starslab.ca/vpace/>.
- [4] O. Limoyo, A. Konar, **T. Ablett**, J. Kelly, F. R. Hogan, and G. Dudek, “Working Backwards: Learning to Place by Picking,” in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS’24)*, Oct. 2024.
- [5] **T. Ablett**, B. Chan, and J. Kelly, “Learning from Guided Play: Improving Exploration for Adversarial Imitation Learning with Simple Auxiliary Tasks,” *IEEE Robotics and Automation Letters*, vol. 8, no. 3, pp. 1263–1270, March 2023, <https://papers.starslab.ca/lfgp/>.

- [6] 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**.
- [7] **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, <https://papers.starslab.ca/lfgp/>.
- [8] **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, <https://papers.starslab.ca/multiview-manipulation/>.
- [9] 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.
- [10] 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

- [11] **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

- [12] F. R. Hogan, **T. Ablett**, X. Liu, G. L. Dudek, and A. Feriani, “Continuous Tactile Feedback for Electronic Devices,” *U.S. Patent*, no. US20240353958A1, 2024.
- [13] A. Konar, O. Limoyo, F. Hogan, G. L. Dudek, and **T. Ablett**, “Apparatus and Method for Controlling Robotic Manipulators,” *U.S. Patent*, no. US20240308082A1, 2024.
- [14] J. Kelly, O. Limoyo, and **T. Ablett**, “Method of Calibrating a Mobile Manipulator,” *U.S. Patent*, no. US20200398433A1, 2020.
- [15] 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,” *World International Property Organization (WIPO)*, no. WO2017066870A1, 2017.

## AWARDS

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### Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)

*University of Toronto*

September 2020 - August 2021

*Toronto, ON*

- \$5000 per semester, \$15000 total.

### Ontario Graduate Scholarship (OGS)

*University of Toronto*

September 2019 - August 2020

*Toronto, ON*

- \$5000 per semester, \$15000 total.

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

## TEACHING EXPERIENCE

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| <b>University of Toronto</b><br><i>Teaching Assistant</i>  | Winter 2018-Spring 2022<br><i>Toronto, ON</i>   |
| Course Title: AER521 - Mobile Robotics   |   |
| · Robotics course with both undergraduate and graduate level students  |   |
| · Developed, administered, and graded MATLAB/ROS robotics laboratories   |   |
| <b>Coursera.org and University of Toronto</b><br><i>Subject Matter Expert</i>  | October 2018 - April 2019<br><i>Toronto, ON</i> |
| 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.                  |   |
| <b>University of Toronto</b><br><i>Teaching Assistant</i>  | Winter 2018<br><i>Toronto, ON</i>               |
| 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                  |   |
| <b>University of Toronto</b><br><i>Teaching Assistant</i>  | Fall 2016<br><i>Toronto, ON</i>                 |
| 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**

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### **Samsung Research America**

*Research Intern – Applied Reinforcement Learning*

September 2022 - November 2023  
Montreal, QC, Canada

- Development and implementation of new deep reinforcement and imitation learning algorithms to learn control policies to solve real-world robotics problems
- Development, improvement, and maintenance of software libraries for various learning, robotic, and sensing applications

### **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**

*Introductory Level Programming*

September 2013 - April 2015  
Hamilton, ON

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

### **Callisto Integration**

*Controls Engineer in Training*

May 2014 - August 2014  
Hamilton, ON

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

### **Venture Engineering and Science Camp**

*Computer/Technology/Robotics Instructor*

May 2013 - April 2014  
Hamilton, ON

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

## **VOLUNTEER EXPERIENCE**

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## 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

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### 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

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### 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