

# 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:* Robotic Imitation Learning Algorithms Inspired by Human Learning Principles

*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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1. 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
2. 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

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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

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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

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

## TEACHING EXPERIENCE

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- University of Toronto** Winter 2018-Present  
*Teaching Assistant* 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** October 2018 - April 2019  
*Subject Matter Expert* 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**

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**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