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. **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

2. 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

3. 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) September 2020 - August 20201
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

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 Winter 2018
Teaching Assistant *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 Fall 2016
Teaching Assistant *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 Winter 2015
Teaching Assistant *Hamilton, ON*

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

- Administered labs using Verilog HDL and Altera based FPGAs

McMaster University Fall 2014
Teaching Assistant *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 April 2015 - June 2016
Controls Engineer in Training *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