

# Lee Clement

## Curriculum Vitae

University of Toronto Institute for Aerospace Studies  
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### Education

- 2013–Present **Ph.D. Candidate**, *University of Toronto*.  
Mobile Robotics, Autonomous Navigation, Sensor Fusion, Computer Vision
- 2010–2013 **B.Sc.(Maj.) with Distinction**, *University of Manitoba*, GPA: 4.31/4.50.  
Physics, Computer Science
- 2006–2010 **B.Comm.(Hons.) with Distinction**, *University of Manitoba*, GPA: 4.13/4.50.  
Accounting, Finance

### Research Experience

- 2013–Present **Ph.D. Candidate**, *University of Toronto Institute for Aerospace Studies*.  
*Thesis*: Dense visual-inertial navigation for autonomous mobile robots  
*Supervisor*: Prof. Jonathan Kelly
- 2013 **Research Assistant**, *Argonne National Laboratory - Physics Division*.  
Participated in experiments with the Argonne Tandem Linac Accelerator System (ATLAS).  
*Supervisors*: Prof. Kumar Sharma and Dr. Jason Clark
- 2012 **Research Assistant**, *University of Manitoba - Physics and Astronomy*.  
Developed and implemented a bipolar outflow model in MATLAB and C for use in astro-physical modelling software.  
*Supervisor*: Prof. Jason Fiege

### Teaching Experience

- 2015 **Teaching Assistant**, *University of Toronto*.  
AER 521 - Mobile Robotics and Perception

### Grants and Awards

- 2015 **NSERC Postgraduate Scholarship - Doctoral Program**, *University of Toronto*.
- 2014 **Kenneth Molson Fellowship**, *University of Toronto*.
- 2014 **NSERC Canada Graduate Scholarship - Master's Program**, *University of Toronto*.
- 2012, 2013 **NSERC Undergraduate Student Research Award**, *University of Manitoba*.
- 2011, 2012 **Centennial Scholarship in Physics**, *University of Manitoba*.

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## Volunteer Work

2014-Present **Director of Finance**, *SEDS-Canada*.

Students for the Exploration and Development of Space (SEDS) is an international group of student-run organizations dedicated to promoting public interest in space.

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## Professional Affiliations

**Student Member**, *IEEE, IEEE Young Professionals, IEEE Robotics and Automation Society*.

**Student Member**, *Canadian Image Processing and Pattern Recognition Society (CIPPRS)*.

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## Publications

- [1] V. Peretroukhin, L. Clement, M. Giamou, and J. Kelly, "PROBE: Predictive Robust Estimation for Visual-Inertial Navigation," in *Proceedings of the 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, to appear, Hamburg, Germany, Sep. 2015.
- [2] L. Clement, J. Kelly, and T. D. Barfoot, "Monocular Visual Teach and Repeat Aided by Local Ground Planarity," in *Proceedings of the 10th Conference on Field and Service Robotics (FSR)*, to appear, Toronto, Canada, Jun. 2015.
- [3] L. Clement, V. Peretroukhin, J. Lambert, and J. Kelly, "The Battle for Filter Supremacy: A Comparative Study of the Multi-State Constraint Kalman Filter and the Sliding Window Filter," in *Proceedings of the 12th Conference on Computer and Robot Vision (CRV)*, Halifax, Canada, Jun. 2015, pp. 23–30.
- [4] V. Peretroukhin, L. Clement, and J. Kelly, "Get to the Point: Active Covariance Scaling for Feature Tracking Through Motion Blur," in *Proceedings of the ICRA Workshop on Scaling Up Active Vision*, Seattle, USA, May 2015.
- [5] L. Clement, J. Kelly, and T. D. Barfoot, "Monocular Vision for Long-range Visual Teach and Repeat in Unstructured Environments," *NSERC Canadian Field Robotics Network (NCFRN) and Conference on Computer and Robot Vision (CRV) Joint Poster Session*, May 2014.
- [6] B. Russell, L. Clement, J. Hernandez, A. Byagowi, D. Schor, and W. Kinsner, "Implementation of a Nanosatellite Attitude Determination and Control System for the T-Sat1 Mission," in *Proceedings of the Canadian Conference on Electrical and Computer Engineering (CCECE)*, Regina, Canada, May 2013.