

Lee Clement, PhD

Researcher, Engineer and Leader in Autonomous Vehicles

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Experience

Staff Engineer, Tech Lead Manager · Oxa (formerly Oxbotica)

Canada (Remote)

Planning ML · OxaDriver · Previously Tech Lead Manager (Prediction)

2021 - Present

- Own architecture, R&D and delivery of ML Planning capabilities for L4 autonomous vehicles “driven by Oxa.”
- Line manager for 5 direct reports, responsible for recruitment and onboarding for the team.
- Previously led team of teams to co-design, implement and integrate refreshed scene representation, prediction and planning stack in Oxa Driver; deployed working prototype to test vehicle in 6 months.

Software Engineer · Oxa (formerly Oxbotica)

Toronto, Canada

Object Tracking & Prediction · OxaDriver

2019 - 2021

- Developed object tracking and motion forecasting algorithms for autonomous vehicles.

Subject Matter Expert · Coursera

Toronto, Canada

Self-Driving Cars Specialization · University of Toronto

2018

- Co-created the State Estimation and Localization course of the Coursera Self-Driving Cars Specialization.

Course Instructor / Teaching Assistant · University of Toronto

Toronto, Canada

Division of Engineering Science

2015 - 2018

- Graduate level: AER 521 (Mobile Robotics and Perception), ROB 501 (Computer Vision for Robotics)
- Undergraduate level: ROB 301 (Introduction to Robotics)

Graduate Researcher · University of Toronto

Toronto, Canada

STARS Lab · Institute for Aerospace Studies · Vector Institute

2013 - 2019

- Conducted and published independent research on enhancing visual navigation using generative models.
- Postgraduate Affiliate of the Vector Institute for Artificial Intelligence.
- Invited participant, RSS Pioneers (2018); Student Mentor, Inclusion@RSS.

Education

Doctor of Philosophy · University of Toronto

Toronto, Canada

STARS Lab · Institute for Aerospace Studies · Vector Institute

2013 - 2019

- Thesis: “On learning models of appearance for robust long-term visual navigation.” Advised by Prof. Jonathan Kelly.
- Supported by a competitive NSERC Postgraduate Scholarship - Doctoral Program, valued at \$63,000.

B.Sc. (Distinction), Physics & Computer Science · University of Manitoba

Winnipeg, Canada

Department of Physics and Astronomy · Department of Computer Science

2010 - 2013

- GPA: 4.31 / 4.50
- Received two NSERC Undergraduate Student Research Awards in 2012 and 2013.

Selected Publications

- [1] L. Clement, M. Gridseth, J. Tomasi, and J. Kelly, “Learning matchable image transformations for long-term metric visual localization,” *IEEE Robotics and Automation Letters (RA-L)*, 2020, presented at ICRA.
- [2] —, “Matchable colorspace transformations for long-term metric visual localization,” in *CVPR Workshop on Image Matching*, Long Beach, USA, Jun. 2019.
- [3] L. Clement and J. Kelly, “How to train a CAT: Learning canonical appearance transformations for robust direct localization under illumination change,” *IEEE Robotics and Automation Letters (RA-L)*, 2018, presented at ICRA.
- [4] V. Peretroukhin[†], L. Clement[†], and J. Kelly, “Inferring sun direction to improve visual odometry: A deep learning approach,” *International Journal of Robotics Research (IJRR)*, 2018, [†]Equal contribution.

Skills & Interests

Technical	Robot Autonomy, Motion Forecasting, Machine Learning, State Estimation, Software Engineering
Coding	Python, C/C++, PyTorch, TensorFlow, NumPy, SciPy, Pandas, Git, MATLAB, LaTeX
Languages	English, French
Interests	Prediction & Interactive Planning, Generative Models, Representation Learning, Technology Ethics

Professional Activities

Peer Reviewer

Various locations

RSS, ICRA, IROS, FSR, MFI, CRV, IJRR, T-RO, JFR, IEEE RAS

2014-2020

- Provided timely and relevant peer reviews for a range of top Robotics conferences and journals.

Organizer · Debates on the Future of Robotics Research Workshop

Various locations

IEEE International Conference on Robotics and Automation

2019-2020

- The Debates on the Future of Robotics Research Workshop brings together prominent researchers and industry leaders to formally debate key issues affecting robotics as an academic discipline and its broader social and economic contexts.

Postgraduate Affiliate · Vector Institute for Artificial Intelligence

Toronto, Canada

Vector Institute Postgraduate Affiliate Program

2019-2020

- The Vector Institute drives excellence and leadership in Canada's knowledge, creation, and use of artificial intelligence (AI) to foster economic growth and improve the lives of Canadians.

Invited Participant · RSS Pioneers Workshop

Pittsburgh, USA

Robotics: Science and Systems

2018

- RSS Pioneers is a day-long invitation-only workshop for senior graduate students and postdocs, held in conjunction with Robotics: Science and Systems, that seeks to bring together a cohort of the world's top early career researchers in all areas of robotics.

Student Mentor · Inclusion@RSS

Pittsburgh, USA

Robotics: Science and Systems

2018

- Inclusion@RSS focuses on programs that increase and sustain a broader participation in the robotics research community of groups traditionally underrepresented in robotics (including but not limited to: women, LGBTQ+, underrepresented minorities, and people with disabilities), especially people early in their studies and career.