Oliver Limoyo

CONTACT
INFORMATION

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EDUCATION

University of Toronto, Toronto, Canada   2017 - Present
PhD on Learning for Robotics GPA: 4.00/4.00

University of Toronto, Toronto, Canada   2016 - 2017 (Transferred)
MASc on Manipulator Self-calibration GPA: 4.00/4.00

McGill University, Montreal, Canada   2011 - 2016
B.Eng. Mechanical Engineering. GPA: 3.79/4.00

PUBLICATIONS

[1] T. Ablett, **Oliver Limoyo**, A. Sigal, A. Jilani, J. Kelly, K. Siddiqi, F. Hogan, and G. Dudek, "Push it to the demonstrated limit: Multimodal visuotactile imitation learning with force matching," 2023. [Online]. Available: https://arxiv.org/abs/2311.01248

[2] **O. Limoyo**, A. Konar, T. Ablett, J. Kelly, F. Hogan, and G. Dudek, "Working backwards: Learning to place by picking," in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA'24)*, 2024, submitted.

[3] **O. Limoyo**[*], F. Maric[*], M. Giamou, P. Alexson, I. Petrovic, and J. Kelly, "Euclidean equivariant models for generative graphical inverse kinematics," in *Proceedings of the Robotics: Science and Systems (RSS) Workshop on Symmetries in Robot Learning*, Daegu, Republic of Korea, Jul. 10 2023. [Online]. Available: https://arxiv.org/abs/2307.01902

[4] **O. Limoyo**, T. Ablett, and J. Kelly, "Learning sequential latent variable models from multimodal time series data," in *Intelligent Autonomous Systems 17*, ser. Lecture Notes in Networks and Systems, I. Petrovic, E. Menegatti, and I. Markovic, Eds., vol. 577. Cham: Springer Nature Switzerland, 2023, pp. 511–528, best Paper Finalist. [Online]. Available: https://arxiv.org/abs/2204.10419

[5] **O. Limoyo**[*], F. Maric[*], M. Giamou, P. Alexson, I. Petrovic, and J. Kelly, "Generative graphical inverse kinematics," *IEEE Transactions on Robotics*, 2023, submitted. [Online]. Available: https://arxiv.org/abs/2209.08812

[6] **O. Limoyo**, B. Chan, F. Maric, B. Wagstaff, R. Mahmood, and J. Kelly, "Heteroscedastic uncertainty for robust generative latent dynamics," *IEEE Robotics and Automation Letters*, vol. 5, no. 4, pp. 6654–6661, October 2020. [Online]. Available: https://arxiv.org/abs/2008.08157

[7] O. Lamarre, **O. Limoyo**, F. Marić, and J. Kelly, "The canadian planetary emulation terrain energy-aware rover navigation dataset," *The International Journal of Robotics Research*, 2019, accepted January 23, 2020.

[8] F. Marić, **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. [Online]. Available: https://arxiv.org/abs/1908.02963

[9] F. Marić, **O. Limoyo**, L. Petrovic, I. Petrovic, and J. Kelly, "Manipulability maximization using continuous-time gaussian processes," in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'18) Workshop Towards Robots that Exhibit Manipulation Intelligence*, Madrid, Spain, Oct. 1 2018. [Online]. Available: https://arxiv.org/abs/1803.09493

[10] **O. Limoyo**, T. 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 21–25 2018. [Online]. Available: https://arxiv.org/abs/1803.06406

RESEARCH & TEACHING

Robotics & AI Research Intern, Samsung AI Centre Montreal   S2022 - Present
Visuotactile Manipulation, Supervisors: Dr. Francois Hogan and Prof. Gregory Dudek

- Introduce a novel self-supervised data collection method for robotic object placements
- Train an object placement policy using imitation learning
- Implement methods to process camera images from a visuotactile sensor to extract quantities of interest (e.g., force, marker motion, and edge detection)

AI Research Intern, Kindred   S2019 - F2019
Learning to Scan and Sort, Supervisors: Dr. James Bergstra and Prof. Rupam Mahmood

- Analyze the effect of delays and action magnitudes on reinforcement learning algorithms
- Formulate detecting unscannable items from images as a classification or contextual bandit problem and investigate network architectures for this task
- Investigate the use of contrastive losses for learning a representation of multiple camera viewpoints which can then be used for a downstream classification task

Teaching Assistant, University of Toronto   2016 - Present

- **ROB501** - *Computer Vision for Robotics* (Fall 2017-2020)
- **AER521** - *Mobile Robotics and Perception* (Winter 2018)

Research Assistant, McGill - Centre for Intelligent Machines   F2015 - S2016
Dynamic Balancing of a Pick-and-Place Robot, Supervisor: Prof. Jorge Angeles

- Maintain the electronics and implement a PID controller on Simulink and RT-LAB
- Demo the robot running industry test cycles to visitors
- Conceptualize designs in CAD software to increase the test cycles per second.
- Research, find and read articles on the topic of dynamic balancing and Schönflies motion generator

Research Assistant, McGill - Biomedical Microsystems Laboratory   F2014 - W2015
3D Printing of an Embedded Strain Gauge Sensor, Supervisor: Prof. Xinyu Liu,

- Set up and use an open source 3D printer to simultaneously print two different materials
- Research methods to print strain gauge sensors embedded within flexible structures
- Design two proofs of concepts: a glove sensor and buttons for a keyboard

Research Assistant, McGill - Biomechanics Laboratory   S2012
Cyclical Test Frequency Dependence of Aortic Tissue, Supervisor: Prof. Rosaire Mongrain

- Investigate the effect of cyclical loading frequency on aortic tissue in order to be able to run accelerated tests simulating physiological loadings
- Collect and prepare samples of porcine aorta tissue to be installed on a bi-axial tensile test machine
- Measure the stress and strain properties from data

REVIEWING	**IROS** 2023, 2020, **ICRA** 2024, 2022, 2020, 2018, **AAAI** 2022, **RAM** 2022

HONORS & AWARDS	**Alexander Graham Bell Canada Graduate Scholarship**, University of Toronto	2020-2023
	Vector Institute Postgraduate Affiliate, University of Toronto	2020-2022
	Ontario Graduate Scholarship, University of Toronto	2019
	MIP President's Fund: Education Scholarship, MIP	2019
	APSC GSEF Award, University of Toronto	2018
	Ontario Graduate Scholarship, University of Toronto	2017
	NSERC Industrial Undergraduate Student Research Award, McGill University	2015
	Golden Key International Honour Society Invitation, McGill University	2012
	Summer Undergraduate Research in Engineering Award, McGill University	2012

VOLUNTEER SERVICE	**Self-Driving Car Autonomy Team Advisor**, aUToronto	F2017 - S2018
	Lab Representative, Aerospace Students Association	F2017 - S2018
	Athletics Coordinator, Aerospace Students Association	F2016 - F2017
	Autonomous Underwater Vehicle Software Developer, McGill Robotics	F2015 - F2016
	Autonomous Underwater Vehicle Section Leader, McGill Robotics	F2014 - S2015
	National Conference Delegate Experience Member, EWB McGill Chapter	F2014

MISC. INDUSTRY EXPERIENCE	**Customer Engineering Intern**, Pratt and Whitney Canada, R&D	S2015
	Technical Coordinator, Mercedes Textiles	S2014
	Manufacturing Supervisor Intern, Pratt and Whitney Canada, Plant 1	F2013
	Technical Coordinator, Mercedes Textiles	S2013

SKILLS & LANGUAGES	**Systems:** Linux, Windows
	Software: PyTorch, PyBullet, Simulink, AutoDesk Inventor, Solidworks, Git
	Languages & Frameworks: Python, C/C++, ROS, Matlab, Fortran, VBA
	Languages: English (Native), Mauritian Creole (Native), French (Fluent)