

## Matthew Lisondra Research – Robotics & Physics, AI and Computer Vision

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Research interests      Robotics, Simultaneous Localization and Mapping (SLAM), State Estimation, Computer Vision, Autonomous Systems, Deep/Reinforcement Learning

Education      **Toronto Metropolitan University**      Toronto, ON  
MAsc Master's in Mechanical Engineering      Sep 2022 – Present  
(Mechatronics, MEMS and Robotics Engineering)  
Supervised by: Profs. Dr. Sajad Saeedi, Dr. Kourosh Zareinia

**University of Toronto, St. George**      Toronto, ON  
HBSc Honours Bachelor's in Physics/Mathematics      Sep 2017 – June 2021  
Collaborated with: Prof. Dr. Dylan Jones

Publications      ***Visual Inertial Odometry using Focal Plane Binary Features (BIT-VIO)***  
**M. Lisondra<sup>1,\*</sup>**, J. Kim<sup>1,\*</sup>, R. Murai<sup>2</sup>, K. Zareinia<sup>1</sup>, S. Saeedi<sup>1</sup> - [In Review](#)  
(<sup>1</sup>Toronto Metropolitan University, <sup>2</sup>Imperial College London)  
*Submitted The International Conference on Robotics and Automation (ICRA) 2024*

Research experience      **Robotics and Computer Vision Laboratory (RCVL)**      Toronto, ON  
*Toronto Metropolitan University* by Dr. Sajad Saeedi      Sep 2022 – Present  
Worked on Visual-Inertial Sensor Fusion (VIO and SLAM), Autonomous Driving Algorithms, Focal-Plane Sensor-Processor (FPSP) Chips, Reinforcement Learning Pose-Graph Optimization (RL-PGO) research

**Haptics and Telerobotics Laboratory (HapTel)**      Toronto, ON  
*Toronto Metropolitan University* by Dr. Kourosh Zareinia      Sep 2022 – Present  
Worked on Image-Based Force Estimation in Medical Applications research

**Reviewer (Conference) for ICRA 2024**      Fall 2023  
*International Conference on Robotics and Automation (ICRA) 2024*

**Reviewer (Conference) for IEEE CCECE 2023**      Winter 2023  
*2023 Canadian Conference On Electrical and Computer Engineering*

**Reviewer (Conference) for IROS 2023**      Winter 2023  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*

Teaching experience      **Graduate/Teaching Assistant for MEC411**      Winter 2023  
*Mechanics of Machines at Toronto Metropolitan University*  
**Graduate/Teaching Assistant for BME/MEC323**      Fall 2022  
*Statics and Mechanics of Materials at Toronto Metropolitan University*

Industry experience	<b>Virtute Innovation Academy</b>	Richmond Hill, ON
	Department of Mathematics and Science Instructor	Sep 2023 – Present
	Taught online/in-person Physics, Calculus and Computer Science I, II instruction in class sessions of 20-40 students via lecture plans, assignments, examinations Collaborated with: Dr. Albert Jiang	
	<b>Academic Horizons</b>	Surrey, BC
	Senior Physics and Computer Science Instructor	Oct 2021 – Sep 2023
	Taught online 1-on-1 teaching sessions with students, Developed individualized, appropriate learning programs, assisted in collecting and maintaining learner records for the purpose of evaluating student progress	
	<b>Lumist Educational Institution</b>	Toronto, ON
	Lead Physics Instructor (+ Computer Science)	April 2021 – Oct 2021
	Taught online 1st-4th yr. students from UCLA, UC Berkeley, UCSD in class sessions of 40-50 students, delivered instruction in live/recorded/edited lecture video modules Collaborated with: Profs. Dr. Nathan Murray, Dr. Francisco Guevara Parra	
Skills	<b>Coding:</b> Python, PyTorch, keras, R, C/C++, Java, R, C#, Javascript, HTML, CSS <b>Technologies:</b> Windows, Linux, NXP MCUs based on Arm Cortex-M cores	
Extra-Curriculars	<b>Toronto Metropolitan Aerial Vehicles - TMAV</b>	Fall 2022
	Collaborated on Carbon-Cover, Inverse Kinematics of Robotic Arm Projects	

*References available on request.*