

# Matthew Lisondra, Physics HBSc, Eng. MSc (Eng. PhD–Present)

UofT Robotics Institute, Toronto, Canada

University of Toronto

[mattlisondra.com](http://mattlisondra.com)

[Email](#) / [Google Scholar](#) / [LinkedIn](#)

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Research Interests	Robotics, Robot Perception, Robot Learning, Computer Vision, SLAM, Autonomous/Intelligent Systems Algorithms, High Framerate Processing Low-Power Unconventional Sensing, 3D Scene Representations and Spatial AI
Education	<p><b>PhD, Doctor of Philosophy</b> <b>UofT Robotics Institute</b> <b>University of Toronto</b></p> <ul style="list-style-type: none"><li>- Toronto, ON Sep 2024 – Present</li><li>- Focus: Robot Perception, Robot Learning, Computer Vision</li><li>- Leveraging LLM and VLM agents w/ Computer Vision for Robot Learning</li><li>- Thesis Cont. Robot Approach Tracking under Intraclass Variations (A. Fung)</li><li>- Research at the University of Toronto Robotics Institute</li><li>- Supervised by: Dr. G. Nejat of the ASB Lab</li><li>- Referred: Dr. S. Saeedi, Dr. K. Zareinia, Dr. G. Wang, Dr. M. Chevik, Dr. F. Xi</li></ul> <p><b>MASc, Master's of Applied Science</b> <b>Robotics and Computer Vision Laboratory (RCVL)</b> <b>Mechatronics and Robotics Engineering</b></p> <ul style="list-style-type: none"><li>- Toronto, ON Sep 2022 – Aug 2024</li><li>- Focus: Computer Vision and Visual-Inertial SLAM</li><li>- Designed the first 6-DOF Visual Inertial Odometry on FPSPs (BIT-VIO)</li><li>- Thesis Published, Presentation in Yokohama, Japan for IEEE 2024 ICRA</li><li>- Collaboration with Imperial College London and University of Manchester</li><li>- Supervised by: Dr. S. Saeedi of RCVL, Dr. K. Zareinia of HapTel Lab</li><li>- Referred: Dr. D. Jones</li></ul> <p><b>HBSc, Honours Bachelor of Science</b> <b>Physics (Advanced) and Computer Science</b> <b>University of Toronto</b></p> <ul style="list-style-type: none"><li>- Toronto, ON Sep 2017 – June 2021</li><li>- Focus: Robotic Mechanics, Probability, TS-Analysis, Computational Physics</li><li>- Research: Time Series Analysis on Global Temperature, Sea Level Pressure</li><li>- Research: Helium-Neon Laser Analysis (Reviewed by Dr. A. Vutha)</li><li>- Research: Percolation via Random Processes Monte Carlo, Porous Rock</li><li>- Collaborated with: Dr. D. Jones of the APCM Group</li></ul>

**Peer Reviewed Contributions:**

[1] Inverse k-visibility for RSSI-based Indoor Geometric Mapping (In Review)  
J. Kim<sup>2</sup>, **M. Lisondra**<sup>1</sup>, Y. Bahoo<sup>3</sup>, S. Saeedi<sup>3</sup>  
(<sup>1</sup>University of Toronto, <sup>2</sup>TU Delft, <sup>3</sup>TMU)  
[IEEE Sensors Journal \(ISJ\) 2024](#) (In Review)

[2] Visual Inertial Odometry using Focal Plane Binary Features (BIT-VIO)  
**M. Lisondra**<sup>1,\*</sup>, J. Kim<sup>2,\*</sup>, R. Murai<sup>4</sup>, K. Zareinia<sup>3</sup>, S. Saeedi<sup>3</sup>  
(<sup>1</sup>University of Toronto, <sup>2</sup>TU Delft, <sup>3</sup>TMU, <sup>4</sup>Imperial College London)  
Presented in Yokohama, Japan for IEEE 2024 ICRA  
[IEEE International Conference on Robotics and Automation \(ICRA\) 2024](#)  
[Project Webpage](#) / [PDF](#) / [Video](#) / [Presentation](#)

**Forthcoming Contributions:**

[3] TCB-VIO: Tightly-Coupled Focal-Plane Binary-Feature Visual Inertial Odometry (In Progress)  
**M. Lisondra**<sup>1,\*</sup>, J. Kim<sup>2,\*</sup>, G. Shimoda<sup>3</sup>, K. Zareinia<sup>3</sup>, S. Saeedi<sup>3</sup>  
(<sup>1</sup>University of Toronto, <sup>2</sup>TU Delft, <sup>3</sup>TMU)  
[IEEE/ASME Transactions on Mechatronics \(TMECH\) 2025](#) (In Progress)

[4] AnalogPedestrianNet: High Framerate Focal-Plane Sensor-Processor Pedestrian Tracking (In Progress)  
**M. Lisondra**<sup>1</sup>, A. Babaei<sup>2</sup>, A. Ahsan<sup>2</sup>, K. Zareinia<sup>2</sup>, S. Saeedi<sup>2</sup>  
(<sup>1</sup>University of Toronto, <sup>2</sup>TMU)  
[IEEE Conference on Computer and Robot Vision \(CRV\)](#) (In Progress)

**Acknowledged Contributions:**

[5] M<sup>3</sup>RS: Multi-robot, Multi-objective, Multi-mode Routing and Scheduling  
Ishaan Mehta<sup>2</sup>, J. Kim<sup>2</sup>, S. Taghipour<sup>2</sup>, S. Saeedi<sup>2</sup>  
**M. Lisondra**<sup>1</sup> in Experiments, Feedback  
(<sup>1</sup>University of Toronto, <sup>2</sup>TMU)  
[IEEE Robotics and Automation Letters \(RA-L\)](#) (In Progress)

[6] Structure from WiFi (SfW):  
RSSI-based Geometric Mapping of Indoor Environments  
J. Kim<sup>1</sup>, J. A. Zalat<sup>2</sup>, Y. Bahoo<sup>2</sup>, S. Saeedi<sup>2</sup>  
**M. Lisondra**<sup>1</sup> in Experiments, Feedback, Paper Publishing/Review  
(<sup>1</sup>TU Delft, <sup>2</sup>TMU)  
[IEEE 2024 American Control Conference \(ACC\)](#)

Research Affiliations	<b>Autonomous Systems and Biomechatronics Lab (ASB Lab)</b> <b>UofT Robotics Institute</b> <b>University of Toronto</b> <b>(<a href="#">Lab Webpage</a>)</b> - Toronto, ON Sep 2024 – Present - Focus: Robot Perception, Robot Learning, Computer Vision - Research at the University of Toronto Robotics Institute - Affiliated with UofT Temerty Faculty of Medicine (TFM) - Affiliated with Universal Health Network (UHN) - Supervised by: Dr. G. Nejat
	<b>Robotics and Computer Vision Laboratory (RCVL)</b> <b>(<a href="#">Lab Webpage</a>)</b> - Toronto, ON Sep 2022 – Present - Focus: Computer Vision and Visual-Inertial SLAM - Affiliated Research with Imperial College London (i.e. Dyson Robotics Lab) - Affiliated Research with University of Manchester (i.e. MD Lab) - Affiliated Research with University of Bath (i.e. Pering Lab) - Supervised by: Dr. S. Saeedi
	<b>Haptics Telerobotics Laboratory (HapTel Lab)</b> <b>(<a href="#">Lab Webpage</a>)</b> - Toronto, ON Sep 2022 – Present - Focus: Haptics, Robotic Manipulator Operation, Surgical/Medical Robotics - Currently: Image-Based Force Estimation in Medical Applications Research - Supervised by: Dr. K. Zareinia
Organizations	<b>Reviewer (Journal) for ISJ 2025</b> Fall 2024 – Present IEEE Sensors Journal (ISJ) 2025
	<b>Reviewer (Journal) for RA-L 2024</b> Fall 2023 – Present IEEE Robotics and Automation Letters (RA-L) 2024
	<b>Reviewer (Conference) for IROS 2024</b> Winter 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
	<b>Reviewer (Conference) for ICRA 2024</b> Fall 2023 International Conference on Robotics and Automation (ICRA) 2024
	<b>Reviewer (Conference) for IEEE CCECE 2023</b> Winter 2023 2023 Canadian Conference On Electrical and Computer Engineering
	<b>Reviewer (Conference) for IROS 2023</b> Winter 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

## Teaching Affiliations

### **Virtute Innovation Academy (VIA)**

- Toronto, ON Sep 2023 – Present
- Leading Department of Mathematics and Science
- Teaching Higher-Level Physics, Calculus and Computer Science I, II
- Part of VIA Faculty overseeing Ontario Ministry of Education Inspection
- Collaborated with: Dr. A. Jiang

Select List of Students Currently Teaching†, Alumni Taught and **Refereed\***:

Helen Li Hanfei

Linlin Liang Chulin

Nate Feng Botao

**Raya Sun Xiaoru\*** (Multiple Scholarship Offers in Australia, England)

Willow Zheng Kehui

Alex Zhang

**Angel Huang Anqi\*** (Now at Berkeley Music School)

Ben Zheng Yonhchun

**Brian Luo Tian\*** (Full Scholarship Physics, University College Lodon)

**Bridget Yang Liu\*** (Now at King's College London)

**Cindy Yang Xintong\*** (Now at Durhan University)

Frank Chen

**Guo Ye\*** (Now at University of Hong Kong)

Jack Wu Jianpu

**Kevin Sheng, Chuwen** (Multiple University Offers)

Lynn Lin Guanying

**Natty Zhao Te\*** (Multiple University Offers in Business)

Nick Tian Boyue

Astrid Jiajun Pu

Destin Jiayi Qiu

Morson Yuhao Wang

Raylene Xinyue Zhang

Chun Zou

Yizhou Tang Caelon

Samantha Yumo Fan

Annie Ma

Aiden Xiuqi Xu

Kevin Bowen Chen

Freya Li Xin

Ando Li Yi Lan

Caelon Tang Yi†

Fize Chen Yanh†

Leo Li Juale†

Marvin Wu Di†

Raylene Zhang†

Samantha Fan Yumo†

## **Thesis Mentoring/Guidance:**

[7] Autonomous Truck Navigation  
with Trailer Integration via Natural Language Processing (NLP)

J. Kim<sup>2</sup>, R. Raja<sup>3</sup>, A. Jawaid<sup>3</sup>, R. Ha<sup>3</sup>

**M. Lisondra<sup>1</sup>** in Mentoring/Guidance of Thesis

(University of Toronto<sup>1</sup>, <sup>2</sup>TU Delft, <sup>3</sup>TMU)

[Project Webpage](#) / [Conference PDF](#) / [Full Thesis](#)

## **Graduate/Teaching for MEC411**

Winter 2023 – Aug 2024

Mechanics of Machines at Toronto Metropolitan University (TMU)

## **Graduate/Teaching for BME/MEC323**

Fall 2022 – Aug 2024

Statics and Mechanics of Materials at Toronto Metropolitan University (TMU)

## **Academic Horizons★**

- Surrey, BC

Oct 2021 – Sep 2023

- Senior Physics and Computer Science Instructor

- Taught 500+ 1-on-1 Teaching Sessions Physics, Math, Computer Science

- Taught 500+ Class Size Teaching Sessions with Director of Education

- Total Taught 100+ Students (Many now in Science, Engineering)

## **Lumist of Lumi Education★★**

- Toronto, ON

April 2021 – Oct 2021

- Leading Physics Education Sector of Lumist, Lumi Education

- Teaching 1st-4th yr. students from UCLA, UC Berkeley, UCSD, among others

- Textbook Draft/Course Material Written of University Physics I, 500+ Pages

- Total Taught 100+ Students (Many now in Science, Engineering)

- Collaborated with: Dr. N. Murray (Now Algoma University Professor)

- Collaborated with: Dr. F.G. Parra (Now Leading Ace Acumen Academy)

Select List of Students Taught from ★, ★★:

Jack Zheng

Jasmeet Cheema

Arven Gill

Claire Liu

Jack Christofferson

William Burns

Arsalan Khan

Arjan Berar

Jasmeet Bhatthal

Megan Gosal

Gagan Dhanoa

Roha Kashif

Brody Hart  
Gurjaap Kahlon  
Carter Latham  
Kilian Dokaj  
Kelvin Dokaj  
Zara Johal  
Elle Lubinich  
Matias Fisher  
Jasmine Tatla  
Imaan Sandhu  
Oliver Botelho  
Kiyani Lalani  
Syra Johal  
Callum Holland  
Ava Young  
Khaliya Sidi  
Khushi Chahal  
Peri Bennett  
Momin Kashif  
Ava Psefteas  
Kensington Hilts  
Adrian Purewal  
Jeevan Rai  
Breanna McGowan  
Jashan Tatla  
Yousef Marei  
Grace D'Haese  
Nabil Ashrafi  
Rajin Chahal  
Justen Denman  
Ahmed Marei  
Mnria Grewal  
Miya Negrin  
Rafay Naeem  
Dylan Garland  
Innika Singh  
Jessica Bresciani  
Samiksha Dandina  
Jayden Trentini  
Maya Sanger  
Armaan Sandhu  
Gurasees Warrya  
Afifa Anwar  
Sophia Catroppa

Gurjaap Warrya  
Aarya Gill  
Hamza Khan  
Isaiah Sidi  
David Fam  
Nicole Scoten  
Kumayl Abbas  
Waffa Hussain  
Aaron Hayre  
Anthony Ashton  
Curtis Latham  
Kennedy Burrell  
Kent McDermid  
Mustafa Ali Shah  
Damian Jones  
Devin Barrett  
Cooper Dewaal  
Chanden Mann  
Simarjit Minhas  
Justin Hayer  
Gabe Boychuk  
Yazmin Johal  
Chase Marshall  
Dhiya Gill  
Kyra Borgersen

Industry Affiliations

**Rosor Exploration**  
**([Company Webpage](#))**

- Toronto, ON Jan 2024 – Present
- Researcher - Robotics, Geoscientific UAVs and Drones
- Working on Development of Rosor's Active Terrain Following (ATR) System
- Currently: Now Led by H. A. Jaafar
- Collaborated with: R. Efrem

Skills

**Coding:** Python, PyTorch, keras, R, C/C++, Java, R, C#, Javascript, HTML, CSS  
**Technologies:** Windows, Linux, NXP MCUs based on Arm Cortex-M cores

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*References available on request.*