

1 PERSONAL INFORMATION

Name: Kyle Yilin Gao

Degree: PhD, University of Waterloo

Affiliation: Postdoctoral NSERC Fellow, Schmidt Fellow, University of Waterloo **Phone:** +1 226-789-5588

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Google Scholar: <https://scholar.google.ca/citations?user=F-NPRk0AAAAJ&hl=en>

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I have published 49 peer-reviewed papers during my PhD + Postdoctoral Fellowship, including 9 first-authored papers. Total lifetime grants and awards $\approx$ 447,000 (CAD)/ 321,500/ (USD)/ 279,500 (EUR).

Keywords: Computer Vision, Remote Sensing, Photogrammetry, GeoAI, Large Language Models, Foundation Models, LiDAR, 3D Point Clouds, 3D Reconstruction, Geographic Information Systems (GIS)

1.1 Education

University of Waterloo, Waterloo, ON, Canada

Postdoctoral Fellow: Systems Design Engineering

Doctor of Philosophy (PhD): Systems Design Engineering.

May 2025 — Ongoing

April 2021 — May 2025

- Thesis Title: Towards Urban Digital Twins With Gaussian Splatting, Large-Language-Models, and Cloud Mapping Services
- Research: 50+ Computer vision and remote sensing projects.
- Funding: 100,000 + \$ (CAD) in personal scholarships and grants, including external proposal-based funding.

University of Victoria, Victoria, BC, Canada

Master of Science (MSc): Physics

September 2017 — July 2020

University of Waterloo, Waterloo, ON, Canada

Honours Bachelor's degree in Mathematics with Distinction

September 2011 — July 2016

2 AWARDS AND GRANTS: Total: 447,000 (CAD)/ 321,500/ (USD)/ 279,500 (EUR)

2.1 Project Funding and Scholarships (Postdoctoral)

- NSERC CPRA Fellowship (**Awarded**) \$70,000 per year
Natural Sciences and Engineering Research Council of Canada 2026–2028
Canada's premier postdoctoral fellowship, consolidating the former NSERC PDF and Banting programs; **ranked 12th out of 187 applicants** (Computer Science committee), qualifying for the previous **Banting Fellowship**.
- Schmidt AI in Science Postdoctoral Fellowship (**Awarded**) \$95,000 per year
Eric and Wendy Schmidt Foundation 2026–2028
Extremely selective international fellowship spanning nine leading institutions (e.g., Oxford, Cornell, University of Toronto).
- Humboldt Research Fellowship (**In Review**) \$60,000 per year
Alexander von Humboldt Foundation 2026–2028
Prestigious international fellowship supporting globally competitive postdoctoral researchers.

2.2 Personal Awards, Scholarships and Funding (PhD Student)

- | | |
|---|--------------------------------|
| • Ontario Graduate Scholarship (OGS)
<i>Province of Ontario</i> | \$15,000 per year
2023-2025 |
| • President's Graduate Scholarship
<i>University of Waterloo</i> | \$5,000 per year
2023-2025 |
| • Mitacs Accelerate Grant (proposal author and project lead)
<i>Mitacs</i> | \$30,000 per year
2022-2023 |
| • Engineering Dean's Domestic Student Award
<i>University of Waterloo</i> | \$8,500 per year
2022-2023 |

3 PUBLICATIONS

3.1 Summary

- **Total citations: 1300+ (May, 2025). Peer-reviewed publications: 49**
- 33 peer-reviewed journal articles (28 in Q1 Journals), 16 peer-reviewed conference articles.
- 9 first-authored peer-reviewed papers.

Articles are listed in reverse chronological order. My authorship position is highlighted in **bold**. First-authored works are marked in [blue](#).

3.2 Peer-Reviewed Journal Papers

Peer-reviewed journal publications include 28 Q1 journal papers.

- 15 articles in *International Journal of Applied Earth Observation and Geoinformation*. (Q1, IF = 8.6)
- 5 articles in *IEEE Transactions on Geoscience and Remote Sensing* (Q1, IF = 8.6)
- 1 article in *IPSRs Journal of Photogrammetry and Remote Sensing* (Q1, IF = 12.2)
- 1 article in *Computational Visual Media* (Q1, IF = 18.6)
- 1 article in *IEEE Transactions on Circuits and Systems for Video Technology* (Q1, IF = 11.1)
- 1 article in *IEEE Transactions on Intelligent Transportation Systems* (Q1, IF = 8.4)
- 1 article in *IEEE Transactions on Instrumentation and Measurement* (Q1, IF = 5.9)
- 1 article in *International Journal of Digital Earth* (Q1, IF = 4.9)
- 1 article in *Remote Sensing Applications: Society and Environment* (Q1, IF = 4.5)
- 1 article in *IEEE Geoscience and Remote Sensing Letters* (Q1, IF = 4.5)
- 5 articles in quartile $\leq$ Q2 journals.

- [J33](#) **Gao, Kyle**, Y. Gao, H. He, D. Lu, L. Xu, and J. Li, "NERF: Neural radiance field in 3d vision, introduction and review," *Computational Visual Media*. Accepted
- [J32](#) Y. Jia, Q. Liu, H. He, C. Song, **Gao, Kyle**, Z. Wu, and Y. Chen, "High-Accuracy Water Level Estimation Using Super-Resolution Sentinel-1 Data," *International Journal of Applied Earth Observation and Geoinformation*, vol. 146, p. 105156, 2026
- [J31](#) S. Zheng, C. Ye, Y. Li, Q. Xie, Y. Zhou, J. Deng, **Gao, Kyle**, and M. A. Chapman, "SaLSE-net: a self-attention-based local structure enhancement network for landslide point cloud segmentation," *International Journal of Digital Earth*, vol. 19, no. 1, p. 2595413, 2026
- [J30](#) **Gao, Kyle**, D. Lu, H. He, L. Li, L. Xu, M. A. Chapman, and J. Li, "Gaussian Building Mesh (GBM): Extract a Building's 3D Mesh with Google Earth and Gaussian Splatting," *Remote Sensing Applications: Society and Environment*, p. 101807, 2025
- [J29](#) **Gao, Kyle**, D. Lu, H. He, L. Li, L. Xu, and J. Li, "Digital buildings analysis: 3d modeling, gis integration, and visual descriptions using gaussian splatting, chatgpt/deepseek, and google maps platform," *IEEE Geoscience and Remote Sensing Letters*, vol. 22, 2025. doi: 10.1109/LGRS.2025.3606333

- J28 C. Ziyi, L. Tingyu, L. Dilong, G. Jin, W. Cheng, **Gao, Kyle**, L. Jonathan, and G. Zheng, “Leveraging multi-view images to learn domain-invariant discriminative embeddings for cross-view geo-localization,” *IEEE Transactions on Circuits and Systems for Video Technology*, 2025. doi:10.1109/TCSVT.2025.3613262
- J27 D. Lu, **Gao, Kyle**, J. Li, D. Zhang, and L. Xu, “Exploring token serialization for mamba-based lidar point cloud segmentation,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 63, 2025. doi:10.1109/TGRS.2025.3605383
- J26 **Gao, Kyle**, D. Lu, H. He, L. Li, N. Chen, L. Xu, and J. Li, “Instructor-Worker Large Language Model System for Policy Recommendation: a Case Study on Air Quality Analysis of the January 2025 Los Angeles Wildfires,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 143, p. 104774, 2025
- J25 D. Lu, J. Zhou, **Gao, Kyle**, L. Xu, and J. Li, “3DLST: 3D Learnable Supertoken Transformer for LiDAR Point Cloud Scene Segmentation,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 140, p. 104572, 2025
- J24 J. Du, L. Xu, L. Ma, **Gao, Kyle**, J. Zelek, and J. Li, “3D semantic segmentation: Cluster-based sampling and proximity hashing for novel class discovery,” *ISPRS Journal of Photogrammetry and Remote Sensing*, vol. 223, pp. 274–295, 2025
- J23 **Gao, Kyle**, D. Lu, H. He, L. Xu, and J. Li, “Enhanced 3D Urban Scene Reconstruction and Point Cloud Densification using Gaussian Splatting and Google Earth Imagery,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 63, 2025. doi:10.1109/TGRS.2025.3536169
- J22 D. Lu, L. Xu, J. Zhou, **Gao, Kyle**, Z. Gong, D. Zhang, and J. Li, “3D-UMamba: 3D U-Net with State Space Model for LiDAR Point Cloud Segmentation,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 136, p. 104401, 2025
- J21 Z. Chen, H. Wang, X. Wu, J. Wang, X. Lin, C. Wang, **Gao, Kyle**, M. Chapman, and D. Li, “Object detection in aerial images using DOTA dataset: A survey,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 134, p. 104208, 2024
- J20 N. Yang, L. Li, L. Han, **Gao, Kyle**, S. Qu, and J. Li, “Retrieving heavy metal concentrations in urban soil using satellite hyperspectral imagery,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 132, p. 104079, 2024
- J19 D. Lu, **Gao, Kyle**, Q. Xie, L. Xu, and J. Li, “3DGTN: 3-D dual-attention GLocal transformer network for point cloud classification and segmentation,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 62, pp. 1–13, 2024
- J18 D. Lu, J. Zhou, **Gao, Kyle**, J. Du, L. Xu, and J. Li, “Dynamic clustering transformer network for point cloud segmentation,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 128, p. 103791, 2024
- J17 Y. Cai, B. Hu, H. He, **Gao, Kyle**, H. Xu, Y. Zhang, S. Pirasteh, X. Wang, W. Chen, and H. Li, “Automatic error correction: Improving annotation quality for model optimization in oil-exploration related land disturbances mapping,” *The Egyptian Journal of Remote Sensing and Space Sciences*, vol. 27, no. 1, pp. 108–119, 2024
- J16 Z. Gong, R. He, **Gao, Kyle**, and G. Cai, “Scene-aware Online Calibration of LiDAR and Cameras for Driving Systems,” *IEEE Transactions on Instrumentation and Measurement*, p. 1–1, 2023
- J15 L. Li, L. Han, **Gao, Kyle**, H. He, L. Wang, and J. Li, “Coarse-to-fine matching via cross fusion of satellite images,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 125, p. 103574, 2023
- J14 L. Li, L. Han, M. Liu, **Gao, Kyle**, H. He, L. Wang, and J. Li, “SAR-Optical Image Matching with Semantic Position Probability Distribution,” *IEEE Transactions on Geoscience and Remote Sensing*, 2023
- J13 Z. Chen, Y. Luo, Y. Chen, J. Wang, D. Li, **Gao, Kyle**, C. Wang, and J. Li, “BrGAN: Blur Resist Generative Adversarial Network With Multiple Joint Dilated Residual Convolutions for Chlorophyll Color Image Restoration,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 61, pp. 1–12, 2023

- J12 **Gao, Kyle**, H. He, D. Lu, L. Xu, L. Ma, and J. Li, “Optimizing and Evaluating Swin Transformer for Aircraft Classification: Analysis and Generalizability of the MTARSI Dataset,” *IEEE Access*, vol. 10, pp. 134427–134439, 2022
- J11 X. Lei, H. Guan, L. Ma, Y. Yu, Z. Dong, **Gao, Kyle**, M. R. Delavar, and J. Li, “WSPointNet: A multi-branch weakly supervised learning network for semantic segmentation of large-scale mobile laser scanning point clouds,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 115, p. 103129, 2022
- J10 D. Lu, Q. Xie, **Gao, Kyle**, L. Xu, and J. Li, “3DCTN: 3D convolution-transformer network for point cloud classification,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 23, no. 12, pp. 24854–24865, 2022
- J9 W. Liu, J. Liu, Z. Luo, H. Zhang, **Gao, Kyle**, and J. Li, “Weakly supervised high spatial resolution land cover mapping based on self-training with weighted pseudo-labels,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 112, p. 102931
- J8 Y. Lin, T. Zhang, X. Liu, J. Yu, J. Li, and **Gao, Kyle**, “Dynamic monitoring and modeling of the growth-poverty-inequality trilemma in the Nile River Basin with consistent night-time data (2000–2020),” *International Journal of Applied Earth Observation and Geoinformation*, vol. 112, p. 102903, 2022
- J7 H. He, H. Xu, Y. Zhang, **Gao, Kyle**, H. Li, L. Ma, and J. Li, “Mask R-CNN based automated identification and extraction of oil well sites,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 112, p. 102875, 2022
- J6 H. He, **Gao, Kyle**, W. Tan, L. Wang, S. N. Fatholahi, N. Chen, M. A. Chapman, and J. Li, “Impact of Deep Learning-Based Super-Resolution on Building Footprint Extraction,” *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, vol. 43, pp. 31–37, 2022
- J5 H. He, **Gao, Kyle**, W. Tan, L. Wang, N. Chen, L. Ma, and J. Li, “Super-resolving and composing building dataset using a momentum spatial-channel attention residual feature aggregation network,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 111, p. 102826, 2022
- J4 **Gao, Kyle**, M. Chen, S. Narges Fatholahi, H. He, H. Xu, J. Marcato Junior, W. Nunes Gonçalves, M. A. Chapman, and J. Li, “A region-based deep learning approach to instance segmentation of aerial orthoimagery for building rooftop extraction,” *Geomatica*, vol. 75, no. 1, pp. 148–164, 2022
- J3 H. He, Z. Jiang, **Gao, Kyle**, S. Narges Fatholahi, W. Tan, B. Hu, H. Xu, M. A. Chapman, and J. Li, “Waterloo building dataset: A city-scale vector building dataset for mapping building footprints using aerial orthoimagery,” *Geomatica*, vol. 75, no. 3, pp. 99–115, 2022
- J2 P. Zhao, H. Guan, D. Li, Y. Yu, H. Wang, **Gao, Kyle**, J. M. Junior, and J. Li, “Airborne multi-spectral LiDAR point cloud classification with a feature Reasoning-based graph convolution network,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 105, p. 102634, 2021
- J1 N. Chen, L. Sui, B. Zhang, H. He, **Gao, Kyle**, Y. Li, J. M. Junior, and J. Li, “Fusion of Hyperspectral-Multispectral images joining Spatial-Spectral Dual-Dictionary and structured sparse Low-rank representation,” *International Journal of Applied Earth Observation and Geoinformation*, vol. 104, p. 102570, 2021

3.3 Peer-Reviewed Conference Papers

- C16 Q. Wu, **Gao, Kyle**, D. Long, D. A. Clausi, J. Li, and Y. Chen, “KitchenTwin: Semantically and Geometrically Grounded 3D Kitchen Digital Twins,” in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR-W)*, 2026. Accepted
- C15 **Gao, Kyle**, J. Cumming, J. Li, L. Xu, and D. A. Clausi, “A Large Language Model Framework for Automated Retrieval and Validation of Remote Sensing Tiles from Data Catalogues,” in *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, ISPRS, 2026. Accepted. Title changed to: “Risk-Aware LLM Agents for Geospatial Data Retrieval: Design and Preliminary Adversarial Evaluation”

- C14 N. Azad, J. Noa Turnes, **Gao, Kyle**, H. He, L. Xu, and D. A. Clausi, “Benchmarking input-level sentinel-1 and radarsat constellation mission fusion for multi-task sea ice mapping on an extended ai4arctic dataset,” in *Proceedings of the IEEE OCEANS Sanya Conference*, IEEE, 2026. Accepted
- C13 Q. Wu, **Gao, Kyle**, W. Sun, H. He, Y. Chen, D. A. Clausi, and J. Li, “Monocular metric 3d reconstruction for remote island surveying via geometry-consistent transformer and orbital imagery,” in *Proceedings of the IEEE OCEANS Sanya Conference*, IEEE, 2026. Accepted
- C12 D. Szczecina, N. Azad, H. Sun, **Gao, Kyle**, A. Bertnyk, and L. L. Xu, “Sparse Data Tree Canopy Segmentation: Fine-Tuning Leading Pretrained Models on Only 150 Images,” in *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2026)*, 2026. Accepted
- C11 Q. Wu, **Gao, Kyle**, W. Sun, Z. Xu, H. Sun, L. Xu, Y. Chen, D. A. Clausi, and J. Li, “Rapid Forest Fuel Load Estimation via Virtual Remote Sensing and Metric-Scale Feed-Forward 3D Reconstruction,” in *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2026)*, 2026. Accepted
- C10 H. Sun, **Gao, Kyle**, Q. Wu, N. Azad, L. L. Xu, and D. A. Clausi, “Label-Free Forest–Urban Segmentation Using AlphaEarth Foundations,” in *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2026)*, 2026. Accepted
- C9 Q. Wu, **Gao, Kyle**, W. Sun, Y. Chen, D. A. Clausi, and J. Li, “Real-Scale Island Area and Coastline Estimation using Only its Place Name or Coordinates,” in *Proceedings of the OCEANS Conference & Exposition*, 2026. Submitted
- C8 X. Huang, Z. Xu, H. Wu, J. Wang, Q. Xia, Y. Xia, J. Li, **Gao, Kyle**, C. Wen, and C. Wang, “L4DR: LiDAR-4DRadar Fusion for Weather-Robust 3D Object Detection,” in *AAAI Conference on Artificial Intelligence (AAAI-25)*, 2025
- C7 N. Chen, B. Zhang, H. He, Z. Liu, and **Gao, Kyle**, “Synchronizing Spatiotemporal Reflectance Fusion via Dual Bayesian Nonparametric Inference and Explicit Downsampling,” in *IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium*, pp. 10358–10362, IEEE, 2024
- C6 D. Chen, J. Xiao, **Gao, Kyle**, Y. Lu, S. Fatholahi, and J. Li, “Natural Language Aided Remote Sensing Image Few-Shot Classification,” in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, pp. 6298–6301, IEEE, 2023
- C5 X. Liu, S. Qiao, **Gao, Kyle**, H. He, L. Ma, and J. Li, “Nighttime Light Missing Data Retrieval Using Modis Version 6 Satellite Data and Mask Dilated Partial Convolutional Neural Network,” in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, pp. 2989–2992, IEEE, 2023
- C4 D. Chen, T. Cheng, Y. Lu, **Gao, Kyle**, S. Fatholahi, and J. Li, “Research on Fast Detection Method of Wind Turbine in Remote Sensing Image Land Area Based on YOLO,” in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, pp. 2823–2826, IEEE, 2023
- C3 Gao, Kyle** and S. R. Koscielniak, “Beam-Beam Resonance Widths in the HL-LHC, and Reduction by Phasing of Interaction Points,” in *Proc. 13th International Particle Accelerator Conference (IPAC’22)*, pp. 2280–2283, 2022
- C2 H. He, K. Yang, Y. Cai, and **others**, “The impact of data volume on performance of deep learning based building rooftop extraction using very high spatial resolution aerial images,” in *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS*, pp. 1343–1346, IEEE, 2021
- C1 H. He, Z. Jiang, W. Tan, Y. Cai, S. N. Fatholahi, **Gao, Kyle**, H. Xu, B. Hu, L. Qing, and J. Li, “Waterloo Building Dataset: A large-scale very-high-spatial-resolution image dataset for building rooftop extraction,” *Abstracts of the ICA*, vol. 3, pp. 1–2, 2021

3.4 Conference Presentations

- *ISPRS Congress 2026, CSRS: 47th Canadian Symposium on Remote Sensing* July 2026
Title: “VGGT-SLAM for 3D Reconstruction of Low-Altitude Remote Sensing Data: Feasibility and Limitations”
- *ISPRS Congress 2026, CSRS: 47th Canadian Symposium on Remote Sensing* July 2026

Title: “Interactive 3D Scene Segmentation for Construction Sites via Gaussian Splatting and Foundation Models”

- *ISPRS Congress 2026, CSRS: 47th Canadian Symposium on Remote Sensing* July 2026
Title: “Digital Building Analysis (DBA): Cloud-GIS-Based 3D Building Modelling and Multi-Agent AI Analytics Using Gaussian Splatting and Google Maps Platform”
- *ISPRS Congress 2026, CSRS: 47th Canadian Symposium on Remote Sensing* July 2026
Title: “Advances in 3D Urban Reconstruction and Building Mesh Extraction using Gaussian Splatting and Google Earth”
- *CVPR 2026: Workshop on Foundation and Large Vision Models in Remote Sensing* June 2026
Title: “BuildingTwin: Geometrically Grounded Building-Centric 3D Reconstruction for Urban Digital Twins”

3.5 Select Preprints Under Peer-Review (PR) and Others (O)

- PR3** **Gao, Kyle**, P. Kotta, L. L. Xu, J. Li, and D. A. Clausi, “Securing Multi-Agent GIS Systems: Risk Evaluation and Prompt Hardening Optimization,” *preprint*, 2026
- PR2** K. Xiong, S. Xu, **Gao, Kyle**, S. Ao, B. Yang, S. Shen, C. Wen, and C. Wang, “INTEGER++: Scalable Unsupervised Point Cloud Registration via Mining and Transferring Feature-Geometry Coherence,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2026. Submitted, second review round
- PR1** J. N. Turnes, M. Patel, F. J. Pena Cantu, **Gao, Kyle**, L. Xu, and D. A. Clausi, “Is Pre-training Enough? SAR-IceFM: Towards Multi-Task Foundation Models for Sea Ice Classification.” Submitted to *Remote Sensing of Environment*, 2026
- O2** **Gao, Kyle**, “Towards Urban Digital Twins With Gaussian Splatting, Large-Language-Models, and Cloud Mapping Services,” *PhD Thesis*, 2025
- O1** **Gao, Kyle**, “Beam-Beam Resonance Widths in the HL-LHC, and Reduction by Phasing of Interaction Points,” *Msc Thesis*, 2020

4 TEACHING EXPERIENCE

Supervision and Mentorship

I supervised numerous (10+) individual paper-based projects over my PhD. As a postdoc, I mentor the research of 6 graduate students and 2 undergraduate research assistants.

Teaching

University of Waterloo, Department of Geography and Environmental Management

Sessional Lecturer: Geography 316 (Multivariate Statistics in R) September 2024 — December 2024

University of Waterloo, Department of Systems Design Engineering

Sessional Lecturer: SYDE 572 (Introduction to Pattern Recognition) January 2024 — April 2024

University of Waterloo, Department of Geography and Environmental Management

Teaching Assistant and Guest Lecturer-6 courses Waterloo, Canada September 2021 — December 2023

University of Victoria, Department of Physics and Astronomy

Teaching Assistant and Lab Assistant-2 courses Victoria, Canada September 2017 — September 2018

5 RESEARCH EXPERIENCE

University of Cambridge
Visiting Scholar

United Kingdoms
August 2026 – May 2028

- Planning international collaborations on GeoAI and earth foundation models, 3D reconstruction for digital twins.
- Preparing applications the European Research Council Starting Grant, and the Marie Skłodowska-Curie Actions Postdoctoral Fellowship.

University of Waterloo, GIM Lab, VIP Lab
Postdoctoral Fellow

Waterloo, Canada
May 2025 –

- Directing laboratory research on urban 3D reconstruction using Gaussian Splatting.
- Developing climate risk assessment frameworks via cloud-based geographic information systems.
- Advancing self-supervised foundation models for remote sensing and SAR-based sea-ice analysis.
- Managing preparation of multiple manuscripts across these core research themes.
- Obtained prestigious Schmidt AI Fellowship, NSERC CPRA Fellowship.

University of Waterloo, Geospatial Intelligence and Mapping Lab
Graduate Research Assistant

Waterloo, Canada
September 2020 – April 2025

- Executed diverse research initiatives producing over 30 peer-reviewed publications.
- Obtained 60,000 \$ in Mitacs funding and 50,000 \$ in academic scholarships.
- Aided in securing a 310,000 \$ NSERC Discovery Grant alongside the primary investigator (This grant is not included in my personal CV).

TRIUMF, Accelerator Physics Group

Graduate Research Assistant-Particle Accelerator Physics

Vancouver, Canada
January 2018 – July 2020

- Modeled electromagnetic fields within the Large Hadron Collider using Lie algebra.

Undergraduate Research Assistant (Co-op internships) Multiple Positions
Undergraduate Research Assistant

Canada

- *National Research Council of Canada, Quantum Physics Group*: Demonstrated quantum Hall effects in low-temperature experiments on electron dot quantum computing chips.
- *TRIUMF, Accelerator Physics Group*: Created mathematical model of linear electron accelerator.
- *Health Canada*: Parallelized Monte Carlo simulations of radiation on the human body.
- *University of Waterloo, Department of Physics and Astronomy*: Created visualization software and web interface for galactic Doppler shift data (2M++).

6 PROFESSIONAL AND ACADEMIC SERVICES/ACTIVITIES

6.1 Conferences Organization/Committee

- **Chair of Thematic Session, XXV Congress of the International Society for Photogrammetry and Remote Sensing (ISPRS Congress 2026)**: “Multimodal Large Language Models for Remote Sensing”.
- **Chair of Community Contributed Theme, 2026 International Geoscience and Remote Sensing Symposium (IGARSS 2026)**: “CCT.77: Advances in GeoAI systems for Wildfire Monitoring”.
- **Co-chair, Main Organizing Committee of 11th Annual Conference on Vision and Intelligent Systems (CVIS 25)**.
- **Program Committee** for Main Track and AI Alignment Track: *40th Annual AAAI Conference on Artificial Intelligence (AAAI 26)*.

6.2 Journal Editorial Board

- **Special Issue Editor** *Photogrammetric Engineering and Remote Sensing*: “Special Issue on Large Language Model in Remote Sensing: Across Different Modalities.”
- **Special Issue Editor** *Electronics*: “Special Issue on Multimodal Remote Sensing for Wildfire Monitoring.”

6.3 Invited Speaker

- *Aalto University* May 2026
Title: “Extending classical photogrammetry with learning systems; towards digital twins”
- *Chang’an University* July 2025
Title: “An overview of the applications of Large Language Models to Remote Sensing and Geographic Information Systems”
- *East China Normal University* July 2025
Title: “Lie Algebra in Computer Vision, from Homography to SLAM”

6.4 Peer-Reviewer

I have peer-reviewed over 70 manuscripts for the following journals. Top-3 journals in their respective fields are **bolded**.

- ***ISPRS Journal of Photogrammetry and Remote Sensing***
- ***Remote Sensing of Environment***
- ***IEEE Transactions on Pattern Analysis and Machine Intelligence***
- ***IEEE Transactions on Geoscience and Remote Sensing***
- ***IEEE Transactions on Neural Networks and Learning Systems***
- *IEEE Transactions on Visualization and Computer Graphics*
- *IEEE Geoscience and Remote Sensing Letters*
- *IEEE Transactions on Intelligent Transportation Systems*
- *International Journal of Applied Earth Observation and Geoinformation*
- *ACM Transactions on Multimedia Computing, Communications and Applications*
- *Neurocomputing*

6.5 Professional Memberships and Leadership Positions

Committee Member	2026 — Ongoing
<i>Technical Committee on Pattern Analysis and Machine Intelligence</i>	
Professional Member	2024 — Ongoing
<i>Association for Computing Machinery</i>	
Member	2023 — Ongoing
<i>Geoscience and Remote Sensing Society (GRSS)</i>	
Member	2021 — Ongoing
<i>Institute of Electrical and Electronics Engineers (IEEE)</i>	
Student Representative of Canada on the ICA	2023 — 2025
<i>International Cartographic Association (ICA)</i>	
<i>Commission on Geospatial Data Analytics</i>	
Student Committee Vice Chair	2023 — 2025
<i>Canadian Institute of Geomatics (CIG)</i>	
Waterloo Chapter Student Representative	2020 — 2025
<i>Canadian Remote Sensing Society (CRSS)</i>	