

**Mingke Erin Li, Ph.D.**[mli.erin1919@gmail.com](mailto:mli.erin1919@gmail.com)**Education**

---

- 2023 Ph.D., Geomatics Engineering, University of Calgary, Canada  
2019 M.Sc., Forestry, University of New Brunswick, Canada  
2017 B.Sc., GIScience, Nanjing Forestry University, Nanjing, China

**Research Interests**

---

Discrete Global Grid Systems  
Geographic Information Science  
Spatial Analysis  
Geostatistics  
Machine Learning  
Topographical Modeling  
Flood Susceptibility Modeling  
Forest Ecology

**Peer-reviewed Publications**

---

- 2024 Liao, C.; Engwirda, D.; Cooper, M.; **Li, M.**; Fang, Y. Discrete Global Grid System-based flow routing datasets in the Amazon and Yukon basins. *Earth System Science Data*. Pre-print.
- 2024 **Li, M.**; Tousignant, C.; Chaudhuri, C.; Chabbouh, A. Utilizing serverless framework for dynamic visualization and operations in geospatial applications. *International Journal of Digital Earth*. 17(1), 2392835.
- 2024 Liu, J.; Li, J.; Qiao, L.; **Li, M.**; Stefanakis, E.; Zhao, X.; Huang, Q.; Wang, H.; Zhang, C. QuadGridSIM: A quadrilateral grid-based method for high-performance and robust trajectory similarity analysis. *Transactions in GIS*. 00, 1–25.
- 2022 **Li, M.**; McGrath, H.; Stefanakis, E. Multi-scale Flood Mapping under Climate Change Scenarios in Hexagonal Discrete Global Grids. *ISPRS International Journal of Geo-Information*. 11(12), 627.
- 2022 **Li, M.**; McGrath, H.; Stefanakis, E. Topographic Operations in Hexagonal Discrete Global Grid Systems. *International Journal of Applied Earth Observation and Geoinformation*. 113, 102985.
- 2022 **Li, M.**; McGrath, H.; Stefanakis, E. Geovisualization of Hydrological Flow in Hexagonal Grid Systems. *Geographies*. 2(2), 227-244.
- 2021 **Li, M.**; McGrath, H.; Stefanakis, E. Integration of Heterogeneous Terrain Data into Discrete Global Grid Systems. *Cartography and Geographic Information Science*. 48(6), 546-564.

- 2020 **Li, M.**; Stefanakis, E. Geospatial Operations of Discrete Global Grid Systems – A Comparison with Traditional GIS. *Journal of Geovisualization and Spatial Analysis*. 4(2), 26.
- 2020 **Li, M.**; Stefanakis, E. Geo-feature Modeling Uncertainties in Discrete Global Grids: A Case Study of Downtown Calgary, Canada. *Geomatica*. 74, 175-195.
- 2020 **Li, M.**; MacLean, D.A.; Hennigar, C.R.; Ogilvie, J. Previous Year Outbreak Conditions and Spring Climate Predict Spruce Budworm Population Changes in the Following Year. *Forest Ecology and Management*. 458, 117737.
- 2019 **Li, M.**; MacLean, D.A.; Hennigar, C.R.; Ogilvie, J. Spatial-Temporal Patterns of Spruce Budworm Defoliation within Plots in Québec. *Forests*. 10, 232.

### Conference Presentations

---

- 2023 **Li, M.** Flood susceptibility analysis on hexagonal grid meshes: a case study in southern New Brunswick, Canada. Poster presentation at GIS in Education and Research Conference, Mar. 2023, Toronto, Canada.
- 2022 **Li, M.**; McGrath, H.; Stefanakis, E. Analytical operations for terrain data modeled in Discrete Global Grid Systems. Canadian Cartographic Association Conference, May 2022, Online.
- 2021 **Li, M.**; McGrath, H.; Stefanakis, E. Integration of multi-source terrain data on Discrete Global Grids in Canada. Canadian Cartographic Association Conference, May 2021, Online.
- 2020 **Li, M.**; Stefanakis, E.; McGrath, H. National terrain data management on Discrete Global Grids in Canada. AutoCarto 2020, Oct. 2020, Online.
- 2018 **Li, M.**; MacLean, D.A.; Hennigar, C.R.; Ogilvie, J. Spatial-tempol patterns of spruce budworm defoliation within measured plots in Québec. The 9<sup>th</sup> Bi-Annual Eastern Canada - USA Forest Science Conference, Oct. 2018, Fredericton, Canada.
- 2018 **Li, M.**; MacLean, D.A. GIS analyses of factors influencing spruce budworm outbreak initiation in northern New Brunswick. SERG International Workshop, Feb. 2018, Edmonton, Canada.

### Other Invited Talks

---

- 2022 Flood Susceptibility Modeling in Discrete Global Grids under Climate Change Scenarios. Presented at the Canada Centre for Mapping and Earth Observation, Natural Resources Canada, Oct. 2022, Online.
- 2022 Geospatial Data Analysis in Discrete Global Grid Systems – Progress and Perspectives. Presented at the China Agricultural University, May 2022, Online.
- 2022 Quantization, Analysis, and Application of Terrain Data Modeled in Discrete Global Grid Systems. Presented at the International Society for Photogrammetry and Remote Sensing Working Group IV/7 (Geo-Data Management) Webinar, Jan. 2022, Online.

2021 Integration Platform for Canadian Terrain Data: A DGGs Perspective. Presented at the Canada Centre for Mapping and Earth Observation, Natural Resources Canada, Apr. 2021, Online.

---

## Work Experience

---

2023-2024 *GIS Scientist, Geosapiens*

- Large-scale DEM modeling with forests and buildings removed using machine learning techniques.
- On-the-fly operations and visualization on serverless Lambda powered by Discrete Global Grid Systems.
- Coastal flood model development and fluvial flood model calibration based on Height Above the Nearest Drainage model.
- Flood defense model development using supervised and unsupervised machine learning techniques for feature identification in 2D geospatial fields.

2020-2023 *Lab Instructor, Department of Geomatics Engineering, University of Calgary*

- Introduction to Geospatial Information Systems.
- Design and Implementation of Geospatial Information Systems.

2022 *Research Internship, Canada Centre for Mapping and Earth Observation, Natural Resources Canada*

- Flood susceptibility mapping under climate change – a part of the National Flood Hazard Identification and Mapping Program.

2020-2022 *Research Assistant, Department of Geomatics Engineering, University of Calgary*

- Large network analysis component in the project evaluating impact of gasoline station infrastructure contraction on stranded assets.
- Flood susceptibility modeling by machine learning in hexagonal grid systems.
- Automating geospatial data extraction via web services and multi-format data integration.

---

## Awards & Scholarships

---

2022 Canadian Cartographic Association Best Presentation Award

2022 Esri Young Scholars Award – First Runner Up

2021-2022 CRSNG-CREATE DOTS Program Scholarship

2021 Esri Canada Centre of Excellence App Challenge – First Runner Up

2020-2021 Geomatics Engineering Department FGS Award at the University of Calgary

---

## Professional Skills

---

Python, R, Jupyter Notebook, SQL, PostgreSQL  
ArcPy, DGGRID/dggridR, GDAL, Git, Whitebox Tools  
ESRI Products, ArcGIS Online, QGIS, ENVI  
Google Colaboratory, Google Earth Engine, Tableau