Mingke Erin Li, Ph.D.

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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   Liu, J., Li, J., Qiao, L., **Li, M.**, Stefanakis, E., Zhao, X., Huang, Q., Wang, H. and 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 9th 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-present *GIS Scientist, Geosapiens*

- DEM modeling with forests and buildings removed.

- Fluvial flood model calibration.
- Coastal flood model development.
- On-the-fly operations and visualization on serverless Lambda DGGS.

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
ESRI Products, ArcGIS Online, QGIS, ENVI
Google Colaboratory, Google Earth Engine, Tableau