Yuehui Qian

(240) 917 9220 yhqian@umd.edu linkedin.com/in/yuehui-qian-5933b3230/ github.com/yhqianUMD

Education

University of Maryland **Fall. 2021 – Spring. 2025 (Expected)**
Ph.D. student in Geospatial Information Science. *College Park, MD*
*Advisor: Dr. Leila De Floriani, 2020 President of the **IEEE Computer Society***

Wuhan University **Fall. 2018 – Spring. 2021**
M.E. in Cartography and Geographic Information Engineering *Wuhan, China*

Wuhan University **Fall. 2014 – Spring. 2018**
B.S. in Remote Sensing Science and Technology *Wuhan, China*

Relevant Coursework

- Data Structures
- Computer Graphics
- Digital Photogrammetry
- Computer Network and Application
- Computer Vision
- Spatial Data Mining
- Object-Oriented Programming
- Algorithms for Geospatial Computing

Projects

Geospatial data representation and analysis | *C++, Python* **Aug. 2021 – Present**

- Contributed to the development of scalable data representations and algorithms for processing and analyzing scattered big geospatial data.
- Extended an efficient data representation for triangle meshes from a single machine to a distributed computing system, **Apache Spark**.
- Designed and implemented an algorithm for computing the terrain topology on large triangle meshes consisting of **2 billion** vertices.
- Wrapped two software tools, the *Terrain trees* library and the *Simplification on the IA data structure* with **Cython**.

Topology-based terrain segmentation | *Apache Spark, GraphFrames, LiDAR* **Sep. 2022 – Aug. 2023**

- Proposed a new minimalistic representation for encoding the topology of a **Triangulated Irregular Network** (TIN) in Apache Spark.
- Designed new algorithms for computing terrain features of large TINs generated from **LiDAR** points in a distributed cluster.
- Developed a publicly available framework of terrain analysis in Apache Spark using GraphFrames, a **distributed graph processing framework**.
- Conducted efficient and scalable topological analysis of large TINs in a distributed computing system.

Spatiotemporal computing for urban growth | *3D CNN, Machine Learning* **Sep. 2017 – Jun. 2021**

- Produced time-series land use maps from high spatial resolution satellite images using **ERDAS** and **ArcGIS**.
- Designed a spatiotemporal simulation framework to capture **urban expansion patterns** with multi-source data including satellite images and statistical datasets.
- Developed a 3D CNN-based model to simulate urban growth considering **spatial heterogeneity** and temporal dependency.

Publications

- **Yuehui Qian**, Yunting Song, Federico Iuricich, Leila De Floriani. 2023. Topology-based Terrain Segmentation Using **Apache Spark**. Proceedings of the 31st International Conference on Advances in Geographic Information Systems (under review).
- **Yuehui Qian**, Weiran Xing, Xuefeng Guan, Tingting Yang, Huayi Wu. 2020. Coupling cellular automata with area partitioning and spatiotemporal convolution for dynamic land use change simulation. Science of The Total Environment, 137738.
- Weiran Xing, **Yuehui Qian**, Xuefeng Guan, Tingting Yang, Huayi Wu. 2020. A novel cellular automata model integrated with deep learning for dynamic spatio-temporal land use change simulation. Computers & Geosciences, 137, 104430.

Honors

- GIS Summer Research Fellowship, University of Maryland 2023
- Dean's Fellowship, University of Maryland 2021
- National Scholarship **(Top 2.5%)**, Ministry of Education, China 2020
- National Encouragement Scholarship **(Top 10%)**, Ministry of Education, China 2018

Technical Skills

Languages: Python, Matlab, C++, JavaScript, SQL
Tools/Techniques: Apache Spark; Apache Sedona, TensorFlow, Keras, ArcGIS, AutoCAD, ENVI, ERDAS, Linux