Mengling Qiao

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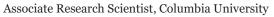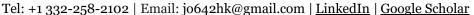
CORE COMPETENCIES

• ESG & Climate Risk Modeling • Quantitative Risk & Resilience Analytics • Sustainable Infrastructure & Policy Advisory • Data Science for Decision Support • GIS

EDUCATION

Wuhan University | *Direct-Entry Ph.D. in Geographic Information Science | CN*   *Sept. 2015 - Dec. 2020*
- o **Awards**: Recipient of 4 graduate studies scholarships×4 (10%, *CNY 40k*), The Scholarship for Outstanding Freshmen (5%, *CNY 20k*)

Nanjing Normal University | *B.Sc. in Geographic Information Science | CN*   *Sept. 2011 - Jun. 2015*
- o **Awards**: Recipient of Talent Scholarship (1%, *CNY 3k*), Outstanding Student Scholarship (2%, *CNY 3k*), National Encouragement Scholarship (1%, *CNY 5k*)

EXPERIENCE

Columbia University in the City of New York   *New York, U.S.*

Associate & Postdoctoral Research Scientist | <u>*Earth and Environmental Engineering*</u>   *Jan. 2023 - present*
Guest Lecturer | <u>*Civil Engineering & Engineering Mechanics*</u> | <u>*Data Science Institute*</u>   *Jan. 2023 - Dec. 2024*

- **Project Management & Stakeholder Delivery**: Co-led $600K+ in climate resilience projects with international partners, coordinating execution and ensuring on-time delivery of all milestones. Experience directly transferable to ESG program management and stakeholder reporting.
- **Evidence Synthesis for Risk Strategy**: Synthesized 1,300+ research and industry reports into cross-agency guidance, shaping infrastructure resilience strategies adopted by public agencies and insurance partners.
- **Driving proposal development& collaboration**: Coordinated 3 multi-disciplinary teams in drafting a $500K NSF proposal on compound climate events, linking smart drainage systems with human mobility patterns to design early-warning frameworks. Demonstrated strengths in grant capture, compliance, and cross-team alignment for resilience and ESG risk management. (ongoing)
- **Capacity Building & Applied Training**: Designed and delivered 3 graduate-level modules on ML/DL and data-driven analytics, using urban flooding and crime risk case studies as hands-on applications.

The Hong Kong University of Science and Technology   *Hong Kong, SAR*

Postdoctoral Fellowship | <u>*Computer Science & Engineering*</u>   *Jul. 2022 - Jan. 2023*

- **Innovation in Decision Support**: Contributed to AR/VR visualization projects, incorporating user testing and geospatial data into interactive platforms for planning and risk communication.
- **Applied Health Risk Research**: Integrated geospatial analytics into a study of elderly mental health during COVID-19, strengthening feasibility and intervention strategies.
- **Efficient Project Delivery**: Accelerated project completion by 4 months ahead of schedule through optimized analysis design and coordination of complex fieldwork logistics.
- **Awards:** Recipient of the <u>Research Talent Hub</u> of Hong Kong (*HKD 431k+*)

The Chinese University of Hong Kong   *Hong Kong, SAR*

Postdoctoral Fellowship | <u>*Geography and Resource Management*</u>   *Jun. 2021 - Jul. 2022*

- **High-Impact Risk Analytics**: Served as primary technical lead on *HKD 3.51M* cross-disciplinary project on pandemic mobility and behavioral change; delivered two end-to-end research solutions in one year, with findings adopted in academic and policy discussions on public health resilience.
- **Policy Translation**: Provided weekly briefings translating data-driven insights into actionable guidance for policymakers on pandemic response and preparedness.
- **Delivered invited talks**: Delivered invited talks at multiple universities to disseminate findings and foster cross-institutional collaboration.

PROJECTS

Urban Infrastructure Risk & Recovery Analytics ⌂ GitHub   *National Science Foundation (2023–2024)*

- Built time-series anomaly detection and network metrics on 3M+ multimodal transportation records (subway, taxi, rideshare, bike).
- Quantified disaster impacts (e.g., Hurricane Ida caused 40% anomalies) and recovery patterns, informing resilience strategies for urban infrastructure and insurers.

Climate & Social Risk Modeling for City Safety *United States-Japan Foundation (2023–2024)*

- Built climate-mobility risk models on 15 years of socio-environmental data, improving predictive reliability by ≈3–5x over benchmarks.
- Generated actionable safety forecasts supporting city resilience planning and ESG risk assessment.

Community Vulnerability Index for Health & Equity *The Chinese University of Hong Kong (2021–2022)*

- Developed vulnerability indices integrating mobility and demographics, achieving 60% stronger correlation with health outcomes vs. traditional measures.
- Developed enhanced GTWR models to capture dynamic patterns in risks and community response, gaining *120+%* outperformance over baseline methods.
- Enabled policymakers and stakeholders to monitor risks and prioritize resource allocation during COVID-19.

Housing Market Risk Forecasting & Investment Insights *Wuhan Natural Resource & Planning Bureau (2018–2019)*

- Designed forecasting model on 30K+ property transactions, combining advanced algorithms to identify market turning points.
- Reduced errors by 25% and provided early-warning signals for housing price shifts relevant to investment and lending.

ESG Data Innovation: Sentiment, Equity & Urban Well-being *Multiple Studies (2018–2025)*

- **Risk & Sentiment Modeling:** Applied NLP and geospatial analytics on 10M+ social media posts to capture real-time sentiment toward heatwave events, enhancing ESG disclosure analysis and risk communication strategies.
- **Street View–Driven Well-being Insights:** Built computational frameworks integrating 166K+ street view images, 125K+ building footprints, and 1.6M+ social media signals; identified key non-linear thresholds (e.g., green view optimal at 45%) linking the built environment to human well-being, supporting urban ESG benchmarks.
- **Economic Segregation Analysis:** Developed multi-level equity metrics from 15M+ human activity records, 121K+ customer reviews, and 39K+ housing transactions; produced a novel segregation index that revealed hidden inequities and informed social sustainability assessments.

HIGHLIGHTS

- *Team Leadership*: Led applications for 3 grant attempts (1 funded, 1 under review); As PI for 1 research project; Led a capstone project ranked 1st of 6 teams; Supervised 3 graduate-level training projects on NLP, ML/DL, and Graph Theory (delivered 32+ invited classes for 30+ graduates); mentoring 2 graduate students.
- *Cross-Functional Engagement*: Designed and led a 4-hour hands-on workshop on "ML/DL for socio-environmental data analytics" at I-GUIDE Forum 2025, training 15+ participants.
- *Project Delivery*: Acted as lead representative in a multi-PI research collaboration team, regularly presenting and coordinating across faculty and researchers; Managed multiple concurrent research timelines across universities and international collaborators, consistently delivering output on time.
- *Research Impact*
  - Published 15+ peer-reviewed papers in top outlets and 2 book chapters, advancing methods in data-driven spatiotemporal analytics and resilient human-environment systems. *Full list: Google Scholar*
  - Delivered 10+ presentations at international conferences.
  - Served as Guest Editor for Applied Science Special Issue "Geospatial Data Processing, Mining and Application".
  - Reviewer of 12+ international journals, delivering 40+ review reports
- *Interests:* Nature Scene, Hiking, Traveling, Boxing, Billiards, Reading

SKILLS

- **ESG & Risk Expertise**
  - *Climate & Environmental Risk Analysis*: Flooding, compound hazards, climate–mobility impacts.
  - *ESG Frameworks*: Familiar with TCFD (climate disclosure), SASB (sustainability accounting), UN SDGs.
  - *Sustainable Infrastructure & Urban Risk*: Critical infrastructure interdependencies and resilience planning.
- **Quantitative & Data Analytics**
  - *Risk Modeling & Forecasting:* Time-series analysis and forecasting, Bayesian analysis, Anomaly detection.
  - *ML/DL/NLP*: PyTorch, TensorFlow, Hugging Face Transformers, scikit-learn, NumPy, Pandas, BERT, LLM, Sentiment & topic model, Graph theory.
  - *Geospatial & Big Data Analytics:* Scraping and analysis of social media posts, mobility, and infrastructure datasets (millions scale).
  - *Analysis & Strategy*: Policy impact analysis, Risk assessment, Performance metrics design, Workflow optimization.
- **Technical Proficiency**
  - *Languages*: Python (10+ yrs), R, SQL, C#, Java.
  - *Databases & Platforms*: Jupyter, MongoDB, Oracle.
  - *GIS & Visualization*: ArcGIS, QGIS, Gephi, Origin.