

Miaojing (Mina) Wei

Mobile: (508) 667-7217 | Email: mw3718@columbia.edu | Website: <https://minawei.github.io>

EDUCATION

Columbia University, New York
Master; Major: Urban Planning

Sep 2023 - May 2025

Clark University, Worcester, MA
Major: Geography; Cum Laude

Sep 2019 - May 2023

- Second honors Dean's List Student 2020 Fall
- Second honors Dean's List Student 2021 Spring
- Alpha Sigma Chapter, The International Geographic Honor Society

SKILLS

Python | ArcPy | R | Spatial Analysis | IDRISI TerrSet | ArcGIS Pro | GitHub | HTML | CSS | JavaScript | Google Earth Engine | StoryMap | SketchUp | Adobe Photoshop | Adobe Illustrator | Adobe Indesign | ENVI

RESEARCH INTERESTS

Urban Mobility & Resilience | Spatial Analysis & GIS | Climate Adaptation Human Activity Data | GeoAI for Urban System | Adaptive Capacity Modeling | Urban Heat & Infrastructure Vulnerability

PUBLICATIONS

Wei, M. (2023). Boundaries of Transgender Access to Public Facilities in the United States. *International Journal of Frontiers in Sociology*, 5(1). <https://doi.org/10.25236/IJFS.2023.050113>

Wei, M., & Zhou, Z. (2022). Spatial Relationship between Environmental Justice and Tier II Facilities in Massachusetts. *Academic Journal of Environment & Earth Science*, 4(6). <https://doi.org/10.25236/AJEE.2022.040603>

Xu, M., Zhou, B., Tian, J., ... **Wei, M., ...** (2025). National-scale sub-meter mapping of *Spartina alterniflora* in Mainland China using an OSPPF composite method. Under review. Preprint available at: <https://doi.org/10.5281/zenodo.16296823>

ACADEMIC PROJECT

Mapping Micro-Scale Heat Risk in New York City: A Fine-Grained Index Incorporating Adaptive Capacity

Solo Author; Advisor: Anthony Vanky | Columbia University; GSAPP

May 2025

- Developed a 30-meter resolution Urban Heat Risk Index integrating Landsat LST, NDVI, LiDAR elevation, dasymetric population mapping, and Citi Bike trip data.
- Created a micro-grid (30×30 m) assessment framework to reveal block-level disparities invisible in census-based HVI models.
- Innovatively incorporated human mobility patterns into the adaptive capacity dimension, capturing real-world exposure based on actual commuter behavior.
- Applied spatial-statistical analysis to model the interaction between exposure, vulnerability, and adaptive capacity in a weighted index.
- Identified patterns of environmental injustice, where heat-vulnerable groups face elevated exposure due to limited adaptive options and transit constraints; proposed spatially targeted interventions such as cool corridors and reflective pavements.

The Cultural and Economic Transformation of Manhattan's Chinatown under Global China

Team Leader (7 members); Global Conference on Economic Geography 2025

Jun 2025

- Led a spatial-political economy study of NYC's three Chinatowns, analyzing local labor circulation, shuttle networks, and restaurant supply chains.
- Traced transnational linkages to China through firm siting patterns in dining, immigration law, logistics, and warehousing sectors.
- Highlighted Chinatown's dual role as a cultural-symbolic gateway and a node in Global China's economic circuits.
- Examined tensions between economic restructuring and gentrification pressures amid Chinatown's shifting urban identity.
- Co-designed a public walking tour (posted on YouTube: [Link](#)), translating research into place-based storytelling.

Comparative Analysis of Machine Learning Approaches for Urban Heat Island Prediction

Project Leader (3 members); Columbia University & Earth and Environmental Engineering Dept.; AAG 2025

Jan 2025

- Evaluated performance of Random Forest, XGBoost, and Convolutional Neural Networks (CNN) in predicting urban heat distribution in NYC using NDVI, elevation, and land cover data at 1-meter resolution.
- Created a spatial holdout validation design by splitting the city into training/testing zones; compared models using MAE, RMSE, and R² metrics.
- Found CNN outperformed traditional methods in spatial pattern recognition; RF and XGBoost offered interpretability for feature importance analysis.
- Identified vegetation and proximity to water as the most influential predictors; findings inform targeted planning strategies to mitigate UHI effects in dense urban environments.

Heat Vulnerability Index Mapping and Analysis in New York City

Team Member(3 members); Advanced Spatial Analysis Course Project

May 2024

- Developed a high-resolution Heat Vulnerability Index (HVI) for New York City, incorporating multi-layered geographic, environmental, and demographic data to assess urban heat risk.
- Utilized geoprocessing techniques, including Principal Component Analysis (PCA), ISO Clustering, Anselin Local Moran's I, and Natural Break Reclassification, to evaluate the impact of different methods on HVI accuracy and spatial distribution.
- Conducted a detailed comparison of HVI values across census block groups, identifying clusters with significant heat vulnerability to guide urban resilience strategies.
- Presented findings through a comprehensive report and visualizations, including high-quality maps, illustrating variations in vulnerability across NYC's boroughs and supporting policy recommendations for targeted heat mitigation.

LuminLeaf Urban Wellness Project([Link](#))

Project Leader (4 members), Columbia University,

May 2024

- Developed the “LuminLeaf” prototype, an installation using Galvanic Skin Response (GSR) sensors to provide real-time emotional feedback through interactive lighting and sound.
- Conducted pilot tests at Columbia University, showing LuminLeaf’s potential to reduce stress and enhance emotional well-being in urban spaces.
- Integrated Arduino-based technology with fiber optics and LED for dynamic visual effects, exploring scalable applications for public settings like parks.

An Analysis of Community Resilience and Response Capacity to Systemic Air Quality Threats in the South Bronx

Team Leaders (3 members); Accepted AAG Annual Meeting 2024

Dec 2023

- Explored systemic air quality impacts on South Bronx Community resilience, focusing on socio-economic and environmental justice dynamics.
- Integrated spatial analysis, factor analysis, and risk modeling with diverse data to assess resilience and vulnerability.
- Evaluated how social vulnerability and environmental injustices affect community resilience to air pollution. Identified green spaces and economic factors as critical to resilience improvement and highlighted the need for policy reforms addressing environmental justice.

Measuring Differences between Rank Variable Wildfire Risk and Burned-Unburned Area Mask: A Case Study from Idaho

Main Researcher (6 members); Accepted AAG Annual Meeting 2023

Dec 2022

- Processed large-scale remote sensing datasets (ESI, NDVI, MODIS) to model and validate rank-variable wildfire risk in Idaho.
- Applied and compared multi-TOC curve visualizations to assess model performance beyond conventional ROC metrics.
- Found ESI-enhanced models improved risk accuracy and reduced misclassification; NDVI seasonality introduced allocation error and degraded model fit.
- Proposed best practices for wildfire risk model evaluation using TOC-based diagnostic frameworks.

Evaluation of the Impact of Various Factors on Forest Loss in Amapa, Para, and Mato Grosso between 2000 and 2020

Team Leader (4 members)

Dec 2020

- Modeled forest loss drivers using TerrSet across Amapá, Pará, and Mato Grosso (2000–2020).
- Simulated land change under varying driver combinations and stratification techniques.
- Answered key methodological questions on simulation accuracy and model complexity.

WORK EXPERIENCE

GSAPP of Columbia University | NY, US

Sep 2023- May 2024

Departmental Research Assistant II

- Conduct data collection and perform comprehensive data analytics to support faculty-led research projects.
- Compile and organize bibliographies, ensuring accurate and up-to-date references for academic research.
- Locate, summarize, and categorize relevant articles and datasets to facilitate research processes.
- Assist in the preparation of research reports and presentations, contributing to the dissemination of research findings.

Central Massachusetts Regional Planning Commission | MA, US

Planning Technician

Jun 2022 - Nov 2022

- Assist in Regional Traffic Count program; Install automatic traffic counters on various roadways in Central Mass; Completed 200 counts
- Recorded Turning movement counts at various intersections in Central Mass; Completed advance setup of recording cameras at intersections; Collected the data and conducted analysis work
- Marked on the map of the corresponding road plans using Arcmap based on the latest traffic plan published on the MassDOT website

Architectural Design & Research Institute of South China University of Technology | Guangzhou, CH

Research Assistant

Jun 2021 - Jul 2021

- Collecting information on bid projects and documenting detailed requirements for a reference
- Read project materials of Haixinsha Park (built for the Guangzhou Asian Games in 2010) to learn how to present a design proposal
- Achieved comparative reports for bidding work; Collected and analyzed the information from previous similar projects