Zhanchao Yang

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EDUCATION

Weitzman School of Design, University of Pennsylvania (Philadelphia, PA, USA) 08/2024-12/2026
Master of City Planning | Concentration: Sustainable Transportation and Infrastructure
Master of Urban Spatial Analytics
Overall GPA: 3.98/4.0

Binghamton University, State University of New York (Binghamton, NY, USA) 08/2020-05/2024
Bachelor of Arts in Geography and GIScience | Minors in Environmental Studies & Global Studies
Overall GPA: 3.88/4.0 | Dean's List (2020-2024) | Summa Cum Laude | Highest departmental honors in Geography

RESEARCH INTERESTS

Transportation Policy, Travel Behavior, Urban Policy, Urban & Transportation Economics, Accessibility and Mobility, Causal Inference, Transportation and Land Use Policy.

PUBLICATIONS

Yang, Z., and Guerra. E. How Daily Telework Intensity Reshapes Weekday Trip-Making: Evidence from the Twin Cities. *Transportation Research Part A*. (under review)

Yang, Z., "Accessibility or Environmental Conservation? Evaluating the relationship between Environmental Protection and Hiking Trails Accessibility via LiDAR & Remote Sensing" (2023). GIS Day. 5. https://orb.binghamton.edu/gisday/5

Yang. Z., O'Day. S., McCann. P., and Lu. I. (2022) Tracking the Spread of Invasive Species in the Binghamton University Natural Preserve. GIS Day. 4. https://orb.binghamton.edu/gisday/4

RESEARCH EXPERIENCE

Telework Intensity and Daily Travel Behavior (Master's thesis) 09/2025-04/2026
Independent Researcher; Faculty Advisor: Dr. Erick Guerra, University of Pennsylvania

- Analyzed travel patterns in the Minneapolis–St. Paul metropolitan area using three waves of Travel Behavior Inventory data (2019, 2021, 2023).
- Applied negative binomial regression, ordered logit models, and propensity-score matching to isolate commuting and non-work travel effects; utilized cluster bootstrap for robust inference.
- Identified a non-linear relationship between daily telework hours and trip generation: moderate telework increases total trips due to induced non-work travel, while high-intensity telework reduces trips.
- Provided evidence that hybrid telework may not decrease travel demand, but instead reshapes it into dispersed, off-peak trips, with implications for transportation planning and policy.

Impact of SEPTA Service Reduction and Budget Constraints on Philadelphia Traffic Speed 09/2025-08/2026
Data Analyst, Research Assistant, and Coauthor
Faculty Advisor: Dr. Gilles Duranton & Dr. Erick Guerra, University of Pennsylvania

- Built analytics data panel using Driving Speed data (~40,000 OD pairs, 120,000+ observations) to assess the impact of transit service cuts on road traffic speed in Philadelphia.
- Developed "cut exposure" metric; applied Difference-in-Differences with OD-pair and time fixed effects; used Chicago and Boston as control cities to remove national trends.
- Leveraged GTFS schedule data to simulate increased transit travel times, quantifying external costs on both riders and non-riders
- Examined how reductions in transit services affect road congestion, with a focus on spatially heterogeneous effects across radial and non-radial travel markets.

Exploring Professional Knowledge of Systematic Differences in Traffic Safety Outcomes Across U.S. Metropolitan Areas 07/2026-Present
Data Analyst and Research Assistant; Faculty Advisor: Dr. Erick Guerra, University of Pennsylvania

- Analyzed five-year U.S. traffic fatality and American Community Survey data to examine spatial variation in traffic safety outcomes across metropolitan areas and counties.
- Co-designed and prepared an online survey using Qualtrics to measure perceptions of traffic fatality rates across major U.S. metropolitan areas.
- Contributed to the design of an interactive engagement tool enabling respondents to estimate and compare traffic safety outcomes by location.

AI Streetscape Analysis for Pedestrian Infrastructure 01/2026-05/2026

Principal Investigator; Faculty Advisor: Dr. Xiaojiang Li, University of Pennsylvania

- Investigated whether computer vision on aerial and street-view imagery can generate scalable intersection-level pedestrian infrastructure data for urban planning.
- Developed a comprehensive processing pipeline combining U-Net segmentation on aerial imagery and YOLO-based object detection on Google Street View to map crosswalk geometry, stop signs, and traffic signals.
- Integrated model outputs with street-network intersection graphs to produce GIS-ready datasets; achieved about 0.94 segmentation performance and generated about 3,600 crosswalk polygons across large areas of Philadelphia.
- Built a website to facilitate the GeoAI application in planning the community

Metro Project of Bogotá 06/2025-08/2025

Research Assistant

Faculty Advisor: Dr. C. Erik Vergel-Tovar, University of the Andes & Dr. Erick Guerra, University of Pennsylvania

- Assisted in data analysis for the paper *Metro Project of Bogotá: Residential Location Choice, Affordability and Perceptions* by Dr. Erik Vergel-Tovar and Dr. Erick Guerra, submitted to Journal of Transport and Land Use.
- Led exploratory segmentation analysis of respondents' attitudes using latent class analysis, k-means clustering, and hierarchical clustering, facilitating deeper understanding of transit preferences.
- Identified key public opinion segments toward the metro project, analyzed the impact of the infrastructure design choices (e.g. underground vs. elevated rail) on public opinion in a developing country, and mapped them to tailored engagement strategies.

Curb Extensions and Traffic Safety 02/2025-04/2025

Research Assistant; Faculty Advisor: Dr. Erick Guerra, University of Pennsylvania

- Acknowledged for data support for the paper *The Effects of Curb Extensions on Traffic Crashes and Injuries* by Dr. Erick Guerra, etc., published in Transportation Research Record.
- Applied propensity score matching to match treated intersections with comparable controls based on roadway width, drainage area, and location, ensuring like-for-like comparison.
- Conducted Moran's I spatial autocorrelation analysis to examine potential spatial bias in crash data and facilitate the main model specification.

Using Public Input, UAV, and iPhone Lidar Technique to Evaluate the Trail Conditions and Accessibility in the Binghamton University Nature Preserve 09/2023-04/2024

Honor thesis (Highest departmental honor in Geography), Binghamton University

Faculty Advisor: Dr. Jay L. Newberry

- Conducted a public survey with over 200 participants to gather local users' opinions on the desired appearance of the trails and the factors they consider important.
- Collected and analyzed data, combining UAV data acquisition and ground data acquisition.
- Proposed a feasible plan of trail improvement to make it inclusive to all users without damaging the natural environment, based on the trail design of other large nature reserves.
- Became a source project for students who have not yet conducted research to participate and learn more about geospatial technology and research workflows.

CONFERENCE PRESENTATIONS

UPenn GIS Day, University of Pennsylvania 11/2025 & 11/2024

Invited Lightning Talk:
Satellite and Population Embeddings: Powerful GeoAI tools or Overrated
Affordable Near-Earth Sensing and Photogrammetry: Digital Twinning Micro-Level Geographic Spaces with GIS **2025 AAG Annual Conference, American Association of Geographers** San Francisco, California, 03/2025

Paper Presentation: Telework Intensity and Daily Travel Behavior: How does Telework Reshape Daily Trip-making in the Minneapolis–Saint Paul Metropolitan Area?
2024 AAG Annual Conference, American Association of Geographers Honolulu, Hawaii, 04/2024

Paper Presentation: Accessibility or Environmental Conservation? Evaluating the relationship between Environmental Protection and Hiking Trails Accessibility via LiDAR & Remote Sensing.

ACADEMIC & PROFESSIONAL EXPERIENCE

PennIUR Spatial Analyst 10/2025- 04/2026

Supervised by Dr. Eugenie Birch, University of Pennsylvania

- Developed an interactive web application to support the Penn Anchor strategies survey and interview framework, utilizing Mapbox GL.
- Led a geospatial data team in processing and digitizing comprehensive building footprints across Penn campus, Penn Medicine, and real estate holdings for mapping
- Contribute to grant-funded research under Dr. Eugenie Birch, using spatial data science to quantify the local economic impact of anchor institutions and redefine Penn Anchor footprint.

Graduate Teaching Assistant 08/2025- 05/2026

Department of City and Regional Planning, University of Pennsylvania
MUSA 5080: Public Policy Analytics, Fall 2025(Dr. Elizabeth Delmelle), Spring 2026(Dr. Allison Lassiter)
MUSA 5000: Spatial Statistics and Data Mining, Fall 2025 (Eugene Brusilovskiy)

- Facilitated technical sessions and office hours for over 40 graduate students, debugging R code and clarifying statistics concepts.
- Evaluated student mastery of spatial regression and machine learning through weekly quizzes and detailed grading of technical reports.
- Critiqued data visualization and narrative flows for mid-term and final projects.

Graduate Research Assistant 10/2024- Present

Supervised by Dr. Erick Guerra, University of Pennsylvania

- In addition to completing necessary RA work, also responsible for mentoring early-stage research assistants.

LOCAL AND ORAL HISTORY PROJECT

Johnson City Oral Histories and Places with Hidden Stories Project 02/2024-07/2024

Co-PI, Research Assistant, Faculty advisor: Dr. David Mixter
Collaborated between Bridgman | Parker Dance Company and Binghamton University Civic Engagement Center

- Conducted interviews with long-time residents of Johnson City and former factory workers to gather insights on the economic and landscape impacts of the closure of Johnson City's shoe factories.
- Used the interview audio to analyze the effects of Binghamton University's urban revitalization efforts in Johnson City, including whether the revitalization causes displacement and the public perception of that involvement.
- Synthesized interview content and collaborated with the cinema department to produce thematic short film pieces, creating cohesive narrative stories.
- Showcased these short films at the LUMA Music Festival and dance performances, with ongoing performance plans alongside Bridgman | Parker shows at national and international venues.

AWARDS & HONORS

C. Britton Harris Award - awarded for excellent work in transportation planning, University of Pennsylvania (2026)
Binghamton University President Award for Student Excellence- Honorable mention (2024)
SUNY Chancellor Award for Student Excellence (2024)

Outstanding Undergraduate Conference Presentation Award (2024)
Harpur Edge Student Support Fellowship (2024)
Undergraduate Research Awards (2023)
Paul F. Gorman '73 Memorial Scholarship (2023)
First Place in Student Poster Competition, Seventh and Eighth Annual GIS Day (2022 & 2023)
People's Choice Award in Student Poster Competition, Seventh Annual GIS Day (2022)

SKILLS

Data Analytics software: ArcGIS Pro, ArcGIS Online, QGIS
Programming languages: R, Python, JavaScript, HTML, CSS
Database management and version control: PostGIS, DuckDB, Git, GitHub