YANG YANG

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Urban data scientist and AI engineer passionate about building innovative solutions for real-world questions using computer vision, geospatial intelligence, and deep learning. Developer of UrbanTrace, an open-source tool for urban change detection, and experienced in applying LLMs and VLMs for analyzing social sentiment around policy. Blends urban planning expertise with full-stack AI development to drive impact at scale.

SKILLS

Programming Languages: Python, R, SAS, SQL, VBA
Platforms & Frameworks: Slurm, Google Colab, Jupyter, Langchain, VSCode, ArcGIS, QGIS, Tableau
Libraries: Pytorch, Scikit-Learn, OpenCV, Pandas, GeoPandas, XGBoost, SHAP, Matplotlib, ggplot2
Methods: linear/logistic regression, spatial autoregressive models, tree-based models, CNN (Resnet, Yolo, etc..), LLM
Planning and Design Related: Adobe Design Suites (Photoshop, Illustrator, Indesign), Synchro, TransCAD, HCM, Vissum, MS Office Suite, AutoCAD, Microstation, Sketchup, Lumion
Languages: English, Mandarin

EDUCATION

University of North Carolina at Chapel Hill | Chapel Hill, NC
PhD in City and Regional Planning | Aug 2019 - Aug 2025
Thesis: "*Explore Urban Regeneration Pattern, Drivers, and Social Impacts in the Southeastern United States Through AI-Powered Analysis*" (Advisor: Yan Song, PhD)

Georgia Institute of Technology | Atlanta,GA
Master of Computer Science (Online) | Aug 2025 - May 2027 (expected)

University of North Carolina at Chapel Hill | Chapel Hill, NC
Master of City and Regional Planning | Aug 2014 - May 2016

School of Architecture, Southeast University | Nanjing, China
Bachelor of Engineering in Urban Planning | Aug 2009 – Jun 2014

EXPERIENCE

Graduate Research Assistant | Chapel Hill, NC
University of North Carolina at Chapel Hill | Aug 2019 – *Present*
AI and Data Related:
- **[Machine Learning | GUI]** Created an open-source *Python*-based computer vision toolkit (UrbanTrace) to detect urban changes at the building level using high-resolution aerial imagery, incorporating deep learning models (*YOLO, Siamese Networks*), and integrated the tool into a *QGIS* plugin with *PyQt*.
- **[Computer Vision]** Processed and analyzed large-scale geospatial datasets (6.5M buildings across 35,000+ square miles) using *Python, PyTorch, OpenCV*, and GIS frameworks.
- **[LLM]** Use *Large Language Models* via *LangChain*—including *GPT-4, Claude 3, Qwen2,* and *LLaMA 3*— to conduct sentiment analysis on 10,000+ Twitter/X posts, evaluating public perception of New York City's congestion pricing plan.
- **[Causal Inference]** Use logistic regression, spatial econometric analysis, and an explainable machine learning model (*XGBoost+SHAP*) to examine urban development trends and demographic shifts with various Python packages
- **[Supervision]** Provided data analysis (*Python* and *R*), machine learning, and GIS support to lab researchers and supervised undergraduate and master's students.

Independent Lecturer (15 Sessions, 3 credits) | Chapel Hill, NC
University of North Carolina at Chapel Hill | Jun 2022 - Jul 2022
- Instructed *Applied Issues in Geographic Information Systems* (PLAN591): Developed syllabus, prepared and presented class lectures, created and recorded GIS tutorials, provided individual guidance in class, and graded assignments and projects.

Transportation Planner   New York, NY
HDR, Inc.   Aug 2016 - Jun 2019
AI and Data Related:
- **[ETL]** Developed a *Python + VBA* pipeline to warehouse, analyze, and visualize transportation data from various sources (*MySQL, CSV, OData*) across the NY/NJ region
- **[MySQL]** Designed and developed a Windows tablet survey application using *Python* and *PyQt*, enabling surveyors to collect 5000+ questionnaires with automated daily uploads to a central *MySQL* server.
- **[Data Visualization]** Built interactive live data dashboards in *Tableau*, integrating *MySQL* databases to visualize transportation analysis results.
- **[Workflow Automation]** Automated data analysis and visualization by developing *VBA* macros in *Excel* and *Adobe Illustrator*.
- **[Data Collection]** Supervised 10+ third-party traffic data collectors in the field and ensured data quality
Planning and Design Related:
- Develop traffic models to assess the environmental impacts of various types of developments.
- Supervised 10+ third-party traffic data collectors in the field for data collection.

Real Estate Analyst   Durham, NC
Traditional Neighborhood Development Partners   Jun 2015 - May 2016
- Developed financial analysis pro forma in Excel, and developed a tool to automatically measure development metrics from design plans in Python.
- Created conceptual architecture designs and comprehensive urban designs using AutoCAD, Sketchup, and Adobe Suites.

PUBLICATIONS

Yang, Y., Ma, X,. Chen, Z,. Song, Y., (2025, Submitted to *Scientific Reports*) Identifying Building-Level Urban Changes with Computer Vision

Yang, Y.. (2025). "Multi-Class Classification of Urban Regeneration Using a Siamese Network: An Analysis with Real-World Data from Portland, Oregon". Oral presentation at AAAI 2025 Workshop (AI for Urban Track)

Ma, X., Song, Y., Lyu, F., **Yang, Y.**, Wang, Y., Li, X., & Zhong, S. (2025). Revitalizing Cities: The 5R Framework Approach to Urban Retrofitting and Big Data Insights. Growth and Change, 56(1), e70018. https://doi. org/10.1111/grow.70018

Yang, Y., Song, Y., Thomas, A., Zhou, J,. Palm, M. (2024, Under 2nd Round Review of *Journal Of Urban Technology*). The voices behind congestion pricing: Unveiling the social backgrounds of supporters and opponents through a large language model.

Yang, Y. & Song, Y (2024). "Assessing New Neighborhood Diversity in Charlotte via Computer Vision" Accepted for oral presentation at the Associate of Collegiate Schools of Planning Annual Conference 2024, Seattle, WA

Yang, Y. & Song, Y (2023). "Analyzing the socioeconomic background of New York congestion pricing opinion makers on social media through LLM" Accepted for oral presentation at the Associate of Collegiate Schools of Planning Annual Conference 2023, Chicago, IL

Yang, Y. & Chang, J. (2016). Study on the safety of outdoor activity space for early school-age children in Nanjing - Exploring strategies for optimizing residential neighborhoods and pre-school waiting spaces. Chinese Society of Urban Planning. (eds.) 60 years of planning: achievements and challenges - Proceedings of the 2016 China Urban Planning Annual Conference (Urban Design and Detailed Planning) (pp. 1599-1613). China Construction Industry Press.

AWARDS AND FELLOWSHIPS

Graduate Student Transportation Grant (UNC-Chapel Hill)	Jul 2024
Carolina Data Challenge 2022 First Place	Sep 2022
Social Science Track: "Flood? Let's Help! San Francisco Flood Health Vulnerability Analysis"	
Transportation Leadership Fellows (UNC-Chapel Hill)	Jan 2020
Awarded in the China National Undergraduate School's Social Study Competition	Sep 2011
Public safety research in chemical industrial districts – Maigaoqiao, Nanjing"	