Xinyuan(Christine) Cui

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Github Pages: https://github.com/ChristineCui12

EDUCATIONAL BACKGROUND

University of Pennsylvania Philadelphia | 08/2025–05/2026
- Major: **Urban Spatial Analytics**
- GPA: 4.0/4.0

The University of Hong Kong (Exchange Program) Hong Kong | 01/2024–05/2024
- Major: **Urban Studies**

Tianjin University (Top-tier University in China) Tianjin, China | 09/2019–06/2025
- Major: **Urban and Rural Planning**
- Degree: **Bachelor of Engineering**

TECHNICAL SKILLS

- **Programming:** R (Advanced proficiency in tidyverse, sf, tidycensus), Python, JavaScript
- **Databases:** PostgreSQL, PostGIS, Google BigQuery, SQL
- **GIS & Analytics:** ArcGIS Pro, Geoda, Fragstats, SPSS
- **Design & Visualization:** AutoCAD, SketchUp, Adobe Illustrator, Photoshop, Enscape, Ecotect, Mars

PROJECTS

Understanding Off-Peak Roadway Safety (Capstone Project) 01/2026-Ongoing
- Developing a predictive model and spatial analytics tool to identify high-speed driving risks and evaluate the safety impact of road infrastructure changes in Philadelphia.
- Building a data-driven dashboard to help city planners mitigate off-peak traffic fatalities by modeling the relationship between road design and high-speed driving.

Evaluating Generative Models for Cloud Removal in Satellite Imagery 03/2026-Ongoing
- Evaluating the performance boundaries of generative AI models (GANs and Diffusion) against traditional multi-temporal methods for satellite imagery cloud removal, utilizing a synthetic dataset of 2,000 Sentinel-2 images with controlled occlusion levels (5% to 70%).
- Quantifying image reconstruction reliability and hallucination thresholds using PSNR, SSIM, and NDVI metrics, aiming to restore critical spatiotemporal data for urban planning, crop yield assessment, and agricultural subsidy distribution.

Philadelphia Computer-Assisted Mass Appraisal (CAMA) System. 03/2026-Ongoing
- Engineering a robust data pipeline in Google Cloud Platform (GCP) for an automated property tax assessment platform, utilizing Cloud Storage, BigQuery, Cloud Functions, and Cloud Run to extract, clean, and transform large-scale municipal property and tax assessment data.
- Developing machine learning models to predict property valuations and deployed the results via an interactive, map-based review dashboard.

Safe Passage: Modeling Crime Risk around SEPTA Bus Stops 09/2025-12/2025
- Engineered a Negative Binomial spatial risk model in R to analyze crime dynamics across 5,884 SEPTA stops, utilizing pseudo-panel fixed effects to isolate the causal impact of ridership on safety.
- Validated model robustness via 5-fold cross-validation and Moran's I (achieving 56% MAE reduction), identifying spatial anomalies to recommend a "Precision Policing" strategy for high-risk corridors.

Yunnan Odyssey: Plan Your Myth 10/2025-12/2025

- Website: https://christinecui12.github.io/dashboard-project/
- A web-based travel planning platform designed to bridge the gap between emotional inspiration and rational logistics. Built with Leaflet, Firebase, and Mapbox, it solves the fragmentation in modern travel planning by integrating social discovery directly with route optimization and budget tracking.

The Path to Parity: Optimizing Residential Sale Price Prediction for Fair Taxation 09/2025-10/2025

- Developed a predictive housing valuation model in R using Zip Code fixed effects and spatial feature engineering (KNN, buffers), achieving an R^2 of 0.84 across 31,000+ properties via weighted 10-fold cross-validation.
- Imputed 8,000+ non-market transactions to enhance dataset robustness and diagnosed spatial assessment bias through residual mapping, formulating recommendations to improve tax equity in systematically misvalued neighborhoods.

A Study on the Spatiotemporal Characteristics and Influencing Factors of Bike-Sharing Integration with Rail Transit 10/2024-12/2024

- Analyzed the spatiotemporal patterns of bike-metro integration by leveraging HDBSCAN clustering to define service areas and performing a typological analysis of station-specific ridership behaviors.
- Identified key influencing factors through quantitative modeling of the built environment, culminating in customized optimization strategies for planners and operators to enhance first-/last-mile connectivity.

Community Environment Optimization Model Based on "Residents' Emotional Value - Residential Land Efficiency" 04/2024-06/2024

- Conducted a Pearson correlation test to investigate the relationship between the residents' happiness score and the comprehensive efficiency score index of residential areas calculated by the TOPSIS algorithm.
- Adopted the XGBoost learning model and the TreeSHAP interpretability framework to analyze the social, economic, and ecological benefit indicators affecting the happiness of residents in high- and low-efficiency residential areas.

Spatio-temporal Analysis of Urban Sentiment Based on Weibo Check-in Comment Data and Baidu Index Time Series 10/2023-12/2023

- Performed a time series analysis of Baidu Index data for Beijing and Shanghai, calculated basic statistical indicators, and selected the top ten words with the highest average values and the lowest and highest coefficients of variation to explore emotional traits.
- Identified the development trends and general cyclical patterns of emotional or event-related keywords through stationarity tests, STL decomposition, periodic extraction, and correlation analysis.

WORK EXPERIENCE

Shenzhen Urban Planning and Design Institute Co., Ltd. 03/09/2024-26/10/2024
No.2 Urban Design Institute Intern Shenzhen, China

- Participated in the Futian District "15th Five-Year" housing planning project by drafting textual content (work reflections, demographic changes, development pathways), gathering and compiling Shenzhen's housing policies and examined changes in supply and demand, and organizing the renovation models for old residential areas
- Completed the funding calculation section in the urban renewal planning project for the Huaqiangbei area in Futian District

Shanghai Tongji Urban Planning & Design Institute Co., Ltd. 07/2023-08/2023
No. 10 Planning and Design Institute Intern Shanghai, China

- Planned Fengxian Future Valley project, involving calculating economic metrics, analyzing land use and fire safety, planning transportation, researching building designs, studying the synthetic bio-industry, and mapping industrial zones for sustainable development

SCHOLARSHIPS AND AWARDS

- Outstanding Student Leader, TJU (10/2023; 10/2020)

- Yuanye Awards for Students, Third national prize (07/2023)
- Milan Design Week—China Collegiate Design Competition & Exhibition, Second national prize (03/2023)