

# YUE LIN

Assistant Instructional Professor  
Center for Spatial Data Science  
University of Chicago  
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## EDUCATION

- 2023      **Ph.D., Geography**  
The Ohio State University, Columbus, OH  
Certificate: Graduate Certificate in College and University Teaching
- 2022      **M.A., Geography**  
The Ohio State University, Columbus, OH
- 2019      **B.S., Geographic Information Science**  
Wuhan University, Wuhan, China

## ACADEMIC EMPLOYMENT

- 2023–      Assistant Instructional Professor, Division of the Social Sciences and the College, University of Chicago, Chicago, IL
- 2022–2023      Graduate Research Associate, Center for Urban and Regional Analysis, The Ohio State University, Columbus, OH
- 2022      Instructor of Record, Department of Geography, The Ohio State University, Columbus, OH
- 2019–2021      Graduate Teaching Associate, Department of Geography, The Ohio State University, Columbus, OH

## RESEARCH AND TEACHING INTERESTS

Geospatial data science  
Geospatial computing  
Urban informatics  
Geospatial technology & social justice  
Location privacy  
Algorithmic fairness & bias

## AWARDS AND HONORS

### External

- 2024      ICA Scholarship (CaGIS-UCGIS 2024 Symposium), *International Cartographic Association*
- 2024      Honorable Mention, William L. Garrison Award for Best Dissertation in Computational Geography, *American Association of Geographers*
- 2023      CaGIS Doctoral Student Scholarship Award, *Cartography and Geographic Information Society*

- 2023 IJGI Travel Award, *ISPRS International Journal of Geo-Information*
- 2023 Fellow, Grad WINGS (Women+ in Geospatial Science) Workshop, Training and Retaining Leaders in STEM - Geospatial Sciences (TRELIS-GS) Program, *University Consortium of Geographic Information Science*
- 2022 Third Place Doctoral Student Paper Award, *East Lakes Division of the American Association of Geographers*
- 2022 ICA Scholarship (AutoCarto 2022), *International Cartographic Association*
- 2022 Third Place Student Lightning Talks Award, *University Consortium for Geographic Information Science*
- 2022 Student Travel Award, *Spatial Analytics and Modeling Specialty Group, American Association of Geographers*
- 2021 First Place Doctoral Student Paper Award, *East Lakes Division of the American Association of Geographers*
- 2021 First Place Student Paper Award, *University Consortium for Geographic Information Science*
- 2021 First Place Award, AAG Robert Raskin Student Competition, *Cyberinfrastructure Specialty Group, American Association of Geographers*
- 2020 AAG Kauffman Runner-Up Award for Best Student Paper in Geography & Entrepreneurship, *American Association of Geographers*

**Internal**

- 2023 E. Willard and Ruby S. Miller Award, *The Ohio State University*
- 2022 Career Development Grant Award, *Council of Graduate Students, The Ohio State University*
- 2022 Fenburr Travel Scholarship for Outstanding PhD Student, *The Ohio State University*
- 2019 Department Travel Scholarship for AAG Annual Meeting, *The Ohio State University*
- 2019 Outstanding Bachelor's Thesis Award, *Wuhan University*
- 2019 Outstanding Graduate Award, *Wuhan University*
- 2018 Wang Zhizhuo Innovative Talent Scholarship (First Class), *Wuhan University*
- 2017 Zhonghaida Scholarship (First Class), *Wuhan University*
- 2016–2018 Outstanding Student Award, *Wuhan University*
- 2016 Second Class Scholarship, *Wuhan University*

**GRANTS**

**External**

- 2022 Location privacy and confidentiality: Towards ethical geospatial big data harnessing. *UCGIS I-GUIDE Community Champions Program, University Consortium for Geographic Information Science*, \$3,000. Role: PI.

2020 Human mobility: Understanding the impact of COVID-19 and its social and economic contexts in Columbus, OH using traffic camera feeds. *National Science Foundation Geospatial Fellows Program, University of Illinois at Urbana-Champaign*, \$2,400. Role: Key personnel (with PI: Ningchuan Xiao).

#### Internal

2023–2024 *Experiential Learning Grants, Chicago Studies, University of Chicago*, \$5,000. Role: PI.

## PUBLICATIONS

### Refereed Journal Articles

- 2024 Xiao, N., Kim, M.J., & **Lin, Y.** A multistart and recombination algorithm for finding many unique solutions to spatial aggregation problems. *Geoinformatica*. In Press. doi: 10.1007/s10707-024-00520-0.
- 2024 **Lin, Y.** & Xiao, N. Exploring the tradeoff between privacy and utility of complete-count census data using a multiobjective optimization approach. *Geographical Analysis*, 56(3), 427–450.
- 2024 **Lin, Y.** Moving beyond anonymity: Embracing a collective approach to location privacy in data-intensive geospatial analytics. *Environment and Planning F*, 3(1-2), 45–63.
- 2024 **Lin, Y.** You are where you live? Evaluating the racial and ethnic (mis)representation in geodemographic classification. *Applied Geography*, 165, 103244.
- 2024 **Lin, Y.** Synthetic population data for small area estimation in the United States. *Environment and Planning B: Urban Analytics and City Science*, 51(2), 553–562.
- 2023 **Lin, Y.** & Xiao, N. Generating small areal synthetic microdata from public aggregated data using an optimization method. *The Professional Geographer*, 75(6), 905–915.
- 2023 **Lin, Y.** Geo-indistinguishable masking: Enhancing privacy protection in spatial point mapping. *Cartography and Geographic Information Science*, 50(6), 608–623.
- 2023 **Lin, Y.** & Xiao, N. Assessing the impact of differential privacy on population uniques in geographically aggregated data: The case of the 2020 U.S. Census. *Population Research and Policy Review*, 42(5), 81.
- 2023 **Lin, Y.**, Xu, C., & Wang, J. sandwichr: Spatial prediction in R based on spatial stratified heterogeneity. *Transactions in GIS*, 27(5), 1579–1598.
- 2023 **Lin, Y.**, Li, J., Porr, A., Logan, G., Xiao, N. & Miller, H. Creating building-level, three-dimensional digital models of historic urban neighborhoods from Sanborn Fire Insurance maps using machine learning. *PLoS ONE*, 18(6), e0286340.
- 2023 **Lin, Y.** & Xiao, N. A computational framework for preserving privacy and maintaining utility of geographically aggregated data: A stochastic spatial optimization approach. *Annals of the American Association of Geographers*, 113(5), 1035–1056.
- 2022 **Lin, Y.** & Xiao, N. Identifying high accuracy regions in traffic camera images to enhance the estimation of road traffic metrics: A quadtree-based method. *Transportation Research Record*, 2676(12), 522–534.

- 2021 Zhang, X., **Lin, Y.**, Cheng, C., & Li, J. Determinant powers of socioeconomic factors and their interactive impacts on particulate matter pollution in North China. *International Journal of Environmental Research and Public Health*, 18(12), 6261.
- 2021 **Lin, Y.**, Kang, M., & He, B. Spatial pattern analysis of address quality: A study on the impact of rapid urban expansion in China. *Environment and Planning B: Urban Analytics and City Science*, 48(4), 724–740.
- 2020 **Lin, Y.**, Wang, J., & Xu, C. Theoretical and empirical comparative evaluations on measures of map association. *Journal of Geographical Systems*, 22, 361–390.
- 2020 **Lin, Y.**, Kang, M., Wu, Y., Du, Q., & Liu, T. A deep learning architecture for semantic address matching. *International Journal of Geographical Information Science*, 34(3), 559–576.
- 2019 **Lin, Y.**, Cai, Y., Gong, Y., Kang, M., & Li, L. Extracting urban landmarks from geographical datasets using a random forests classifier. *International Journal of Geographical Information Science*, 33(12), 2406–2423.

### Refereed Conference Proceedings

- 2024 **Lin, Y.** A multi-objective optimization approach to balancing utility and equity in location-allocation problems. *CaGIS-UCGIS 2024 Symposium*, June 3–6, Columbus, OH.
- 2023 **Lin, Y.** & Xiao, N. Investigating MAUP effects on census data using approximately equal-population aggregations. *12th International Conference on Geographic Information Science (GIScience 2023)*, September 12–15, Leeds, UK.
- 2022 **Lin, Y.** & Xiao, N. Developing synthetic individual-level population datasets: The case of contextualizing maps of privacy-preserving census data. *AutoCarto 2022*, November 2–4, Redlands, CA.

### Software

- 2022 **Lin, Y.**, Xu, C., & Wang, J. sandwichr: Spatial prediction based on spatial stratified heterogeneity. R package version 1.0.4. <https://cran.r-project.org/web/packages/sandwichr/>

### Manuscripts in Submission

- [5] **Lin, Y.** & Kim, J. Pillars of GeoAI in human geography.
- [4] **Lin, Y.** Multi-objective optimization for balancing utility and demographic equity in facility location modeling.
- [3] **Lin, Y.** & Grekousis, G. Can geodemographic clustering be fair? Incorporating social fairness in crisp and fuzzy approaches through a unified framework. Major Revisions at *International Journal of Geographical Information Science*.
- [2] **Lin, Y.** Equity trade-offs in spatial accessibility: Multi-objective optimization of community service supply. Major Revisions at *Environment and Planning B: Urban Analytics and City Science*.
- [1] **Lin, Y.** & Zhao, B. Posthuman cartography? Rethinking artificial intelligence, cartographic practices, and reflexivity. Major Revisions at *Annals of the American Association of Geographers*.

## PRESENTATIONS († PRESENTING AUTHOR)

### Papers Presented at Professional Meetings

- 2024 Lin, Y.† A multi-objective optimization approach to balancing utility and equity in location-allocation problems. *CaGIS-UCGIS 2024 Symposium*, June 3–6, Columbus, OH.
- 2024 Lin, Y.† Geo-indistinguishable masking: Enhancing privacy protection in spatial point mapping. *The 2024 Annual Meeting of the American Association of Geographers*, April 16–20, Honolulu, HI.
- 2023 Lin, Y. & Xiao, N.† Investigating MAUP effects on census data using approximately equal-population aggregations. *12th International Conference on Geographic Information Science (GIScience 2023)*, September 12–15, Leeds, UK.
- 2023 Lin, Y.† & Xiao, N. Exploring the tradeoff between privacy and utility of geographic data using a multiobjective optimization approach. *The 2023 Annual Meeting of the American Association of Geographers*, March 23–27, Denver, CO.
- 2023 Lin, Y., Li, J., Porr, A., Logan, G., Xiao, N. & Miller, H.† Creating high resolution, three-dimensional digital models of historic urban neighborhoods from Sanborn Fire Insurance maps using machine learning. *The 2023 Annual Meeting of the American Association of Geographers*, March 23–27, Denver, CO.
- 2022 Lin, Y.† & Xiao, N. Developing synthetic individual-level population datasets: The case of contextualizing maps of privacy-preserving census data. *AutoCarto 2022, The 24th International Research Symposium on Cartography and GIScience*, November 2–4, Redlands, CA.
- 2022 Lin, Y.† & Xiao, N. Exploring tradeoffs between privacy and utility of geographic data using a multiobjective optimization approach. *The 2022 Annual Meeting of the East Lakes Division of the American Association of Geographers*, October 27–28, Muskegon, MI.
- 2022 Lin, Y.† & Xiao, N. Spatial optimization for protecting privacy and preserving utility of geographically aggregated data. *UCGIS Symposium 2022: GIScience Forward: Meeting the Challenge*, June 7–9, Syracuse, NY.
- 2022 Lin, Y.† & Xiao, N. Examining threats to location privacy in geographically aggregated data with the protection of differential privacy. *The 2022 Annual Meeting of the American Association of Geographers*, February 25–March 1, virtual.
- 2021 Lin, Y.†, Xu, C., & Wang, J. Sandwich: An R package for spatial interpolation based on spatial stratified heterogeneity. *The 2021 Joint Annual Meeting of Applied Geography Conference/East Lakes AAG/West Lakes AAG*, October 14–16, virtual.
- 2021 Lin, Y.† & Xiao, N. Traffic density estimation from camera feeds using deep learning and high accuracy regions. *UCGIS Symposium 2021: Advancing GIScience-informed Policy Solutions*, June 7–11, virtual.
- 2021 Lin, Y.† & Xiao, N. Using deep learning and high accuracy regions for vehicle detection and traffic density estimation from traffic camera feeds. *The 2021 Annual Meeting of the American Association of Geographers*, April 7–11, virtual.
- 2021 Lin, Y.†, Kang, M., Wu, Y., Du, Q., & Liu, T. A deep learning architecture for semantic address matching. *The 2021 Annual Meeting of the American Association of Geographers*, April 7–11, virtual.
- 2020 Lin, Y.†, Cai, Y., Gong, Y., Kang, M., & Li, L. Extracting urban landmarks from geographical datasets using a random forests classifier. *Symposium on AI and Social Good, Carnegie Mellon University*, April 23–24, virtual.

## Campus and Departmental Talks

- 2023 Lin, Y.<sup>†</sup>. Responsible spatial data science: Privacy and fairness in data and algorithms. *GIS Day, University of Chicago*, November 15, Chicago, IL.
- 2023 Lin, Y.<sup>†</sup>, Li, J., Porr, A., Logan, G., Xiao, N. & Miller, H. Creating building-level, three-dimensional digital models of historic urban neighborhoods from Sanborn Fire Insurance maps using machine learning. *Center for Spatial Data Science, University of Chicago*, November 13, Chicago, IL.
- 2023 Lin, Y.<sup>†</sup> Privacy and utility of geographic data. *Graduate Colloquium, The Ohio State University*, January 20, Columbus, OH.
- 2022 Lin, Y.<sup>†</sup> Exploring tradeoffs between privacy and utility of geographic data. *GeoWeek, The Ohio State University*, November 14, Columbus, OH.
- 2022 Lin, Y.<sup>†</sup> Navigating tradeoffs between privacy and utility in geographic data releases. *Geography Grad Students' Reports from the Field, The Ohio State University*, September 23, Columbus, OH.
- 2021 Lin, Y.<sup>†</sup> & Xiao, N. Does differential privacy protect location privacy in geographically aggregated data publication? *3C GIS Day(s), The Ohio State University*, November 15–19, virtual.
- 2020 Lin, Y.<sup>†</sup> & Xiao, N. Traffic density estimation from camera feeds: An approach using deep learning and high accuracy regions. *GeoWeek, The Ohio State University*, November 16, virtual.
- 2020 Lin, Y.<sup>†</sup>, Cai, Y., Gong, Y., Kang, M., & Li, L. Extracting urban landmarks from geographical datasets using a random forests classifier. *Geography Visit Day, The Ohio State University*, March 20, virtual.

## Poster Presentations

- 2024 Mostafavisabet, M.<sup>†</sup>, Tokey, A., Alam, M., Lin, Y., Xiao N., & Miller, H. 3D urban modeling of historic Black neighborhoods using GIS and machine learning: Poindexter Village, Columbus, in 1940. *CaGIS-UCGIS 2024 Symposium*, June 3–6, Columbus, OH.
- 2023 Lin, Y.<sup>†</sup> & Xiao, N. Exploring tradeoffs between privacy and utility of geographic data using a multiobjective optimization approach. *The 37th Edward F. Hayes Advanced Research Forum, The Ohio State University*, February 24, Columbus, OH.
- 2022 Lin, Y.<sup>†</sup> & Xiao, N. Generating small area synthetic microdata for public use: Towards accessible and reproducible spatial data science. *2022 Interdisciplinary Research Fall Forum, The Ohio State University*, November 7–9, Columbus, OH.
- 2022 Lin, Y.<sup>†</sup>, Li, J., Porr, A., Logan, G., Xiao, N. & Miller, H. Ghost neighborhoods of Columbus: Reconstructing historical neighborhoods from Sanborn maps using machine learning. *2022 Interdisciplinary Research Fall Forum, The Ohio State University*, November 7–9, Columbus, OH.
- 2022 Lin, Y.<sup>†</sup> & Xiao, N. A stochastic spatial optimization approach to privacy and utility of geographically aggregated data. *UCGIS Symposium 2022: GIScience Forward: Meeting the Challenge*, June 7–9, Syracuse, NY.

## Invited Talks

- 2024 Reexamining geoprivacy: From anonymity to a harm-based approach. *I-GUIDE Virtual Consulting Office Webinar Series, University of Illinois at Urbana-Champaign*, June 19, virtual.

- 2023 Privacy and utility of geographic data: Revealing, evaluating, and mitigating the externalities of geographic privacy protection. *Shijian Forum, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences*, August 10, Beijing, China.
- 2021 Towards transparent and ethical human mobility data (panelist). *Geospatial Fellows Webinar Series, University of Illinois at Urbana-Champaign*, June 28, virtual.

### Conference and Workshop Organization

- 2024 Program Committee, *CaGIS-UCGIS 2024 Symposium*, June 3–6, Columbus, OH.
- 2024 Co-chair, Responsible GeoAI: Privacy, fairness, and interpretability in spatial data science. *The 2024 Annual Meeting of the American Association of Geographers*, April 16–20, Honolulu, HI.
- 2022 Co-chair, AAG 2022 Summer Series Graduate Forums, *American Association of Geographers*, June 14–August 9, virtual.

### MEDIA COVERAGE

- 2023 3D digital models are resurrecting lost neighborhoods. *Axios*. June 28.
- 2023 Turning old maps into 3D digital models of lost neighborhoods. *Ohio State News*. June 28.
- 2022 Lost Columbus communities reborn with Ghost Neighborhoods project. *The Lantern*. November 22.
- 2022 Recreating “ghost neighborhoods” destroyed by highways: Ohio State researchers studying impact on vulnerable communities. *Ohio State News*. September 15.

### OUTREACH

- 2024 Mapping Chicago’s Past and Present. *Chicago History Museum*. May 11.

### TEACHING

#### University of Chicago

- 2023– GISC 25900: Introduction to Location Analysis (Winter 2025)  
 GISC 27106: Geospatial Data Science for Urban Applications (Autumn 2024)  
 SOCI 20253: Introduction to Spatial Data Science (Summer 2024, Autumn 2024)  
 SOSOC 13320: Social Science Inquiry: Spatial Analysis III (Spring 2024, Spring 2025)  
 GISC 28400: GIScience Practicum (Spring 2024, Spring 2025)  
 GISC 28100: Introduction to Geocomputation (Winter 2024, Winter 2025)  
 GISC 28800: History of Cartography (Winter 2024)  
 GISC 28300: Topics in Geographic Information Science (Autumn 2023)

#### The Ohio State University

- 2022            **Instructor of Record**  
 GEOG 5201: Geovisualization (Spring 2022)
- 2019–2021    **Graduate Teaching Associate**  
 GEOG 4103: Introductory Spatial Data Analysis (Spring 2021)  
 GEOG 5226: Spatial Simulation and Modeling in GIS (Autumn 2020)  
 GEOG 5201: Geovisualization (Spring 2020, Autumn 2021)  
 GEOG 5222: GIS Algorithms and Programming (Autumn 2019)

## MENTORSHIP

### Undergraduate Research Associates

- 2024            Helen Michael, Mathematics, University of Texas at Austin
- 2024            Yassir Atlas, Computer Science, University of Illinois Chicago
- 2024            Marcus Kuo, Economics & Mathematics, University of Chicago
- 2024            Qian Fang Yeap, Economics, University of Chicago

### Mentorship Programs

- 2024            Faculty Mentor, Data Science Institute Summer Lab Program, *University of Chicago*
- 2024            Faculty Partner, Summer Institute in Social Research Methods, *University of Chicago*
- 2023–2024    Mentor, Women+ in Geospatial Mentorship Programme, *Women+ in Geospatial*
- 2023            Research Mentor, Research Mentoring Sessions, The 2023 Annual Meeting of the American Association of Geographers, *American Association of Geographers*

## SERVICE

### Editorial and Advisory Boards

- 2024–2028    Board of Director, *Cartography and Geographic Information Society*

### University Service

- 2020–2021    Ph.D. Representative on Graduate Studies Committee, Graduate Geography Organization, *The Ohio State University*

### Professional Service

- 2022–2023    Education Committee, *University Consortium for Geographic Information Science*
- 2022            Student Assistant, AutoCarto 2022, The 24th International Research Symposium on Cartography and GIScience, *Cartography and Geographic Information Society*
- 2021–2022    Award Committee, Graduate Student Affinity Group (GSAG), *American Association of Geographers*



## **Reviewer**

**Journals:** Annals of the American Association of Geographers, Annals of GIS, Cartography and Geographic Information Science, China Population and Development Studies, Environment and Planning B: Urban Analytics and City Science, ISPRS International Journal of Geo-Information, Journal of Spatial Information Science, Journal of Spatial Science, Scientific Data, The Professional Geographer, Transactions in GIS, Urban Informatics

**Conferences:** GIScience (2023), CaGIS-UCGIS Symposium (2024)

## **Professional Memberships**

American Association of Geographers  
Cartography and Geographic Information Society

## **SKILLS**

**Programming languages:** Python, R, C/C++, NetLogo

**Geospatial software:** ArcGIS Pro, ArcGIS CityEngine, QGIS, GeoDa