

M. NASER LESSANI**PhD Candidate in Geographic Information Science****Graduating Fall 2026**

The Pennsylvania State University

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[LinkedIn](#) | [Google Scholar](#) | [ResearchGate](#)

RESEARCH AND TEACHING INTERESTS

- Spatial Statistics
- Spatial Data Science
- Generative AI in GIScience
- Spatial Epidemiology

EDUCATION

- PhD Candidate in Geographic Information Science, Spring 2024 – present (**GPA 4.0**) Department of Geography, The Pennsylvania State University (Penn State), State College, PA, USA
- PhD Student in Geographic Information Science, August 2022 – December 2023 (**Transferred to Penn State**), Department of Geography, University of South Carolina, Columbia, SC, USA
- Master of Engineering in Surveying and Mapping, June 2022 (**GPA 3.8**), School of Geosciences and Info-Physics, Central South University, Changsha, Hunan, China
- Bachelor of Science in Geodesy Engineering, June 2019 (**GPA 3.5**), Kabul Polytechnic University, Kabul, Afghanistan

ACADEMIC APPOINTMENTS

- Teaching Assistant, GEOG 363: Geographic Information Systems, Department of Geography, The Pennsylvania State University, State College, PA (Spring 2026 - present)
- Instructor of Record for Digital Earth (GEOG 105), Department of Geography, University of South Carolina, Columbia, SC (Fall 2023)
- Research Assistant, Department of Geography, The Pennsylvania State University, State College, PA (Spring 2024 – Fall 2025)
- Research Assistant, Department of Geography, University of South Carolina, Columbia, SC (Fall 2022 and Spring 2023)

AWARDS AND SCHOLARSHIPS

- Enrichment Funding Recipient for Esri's User Conference, July 13–17, 2026, (\$700)
- First place in Robert Raskin Student Paper Competition at 2026 AAG Conference, 2026, (\$400)
- Recipient of the Departmental Conference Travel Award to Attend AAG 2026, Penn State University, Spring 2026, (\$800)

- Travel Award Recipient, International Journal of Geo-Information, 2026, (\$1,000)
- Outstanding Graduate Research Assistant at Penn State University, 2025, (\$800)
- Recipient of the Departmental Conference Travel Award, Penn State University, Spring 2025, (\$500)
- Graduate Student's Enrichment Funding, University of South Carolina, August 2022 – December 2023, (\$6000)
- Excellent Graduate Student Research Funding, University of South Carolina, August 2022 – December 2023, (\$9000)
- Outstanding International Students at Central South University, Changsha, Hunan, China, 2022, (\$500)
- Outstanding Presenter (2nd Place), International Water Conference, Kabul Polytechnic University, Kabul, Afghanistan, May 2018
- Recipient of a Fully Funded Scholarship for My PhD Program
- Recipient of a Fully Funded Scholarship During Master's Studies in China

PUBLICATIONS

Book chapter

- Li, Z., Khosravi Kazazi, A., Akinboyewa, T., Lessani, M. N., Qiao, S., and Li, X., 2026. Autonomous GIS for HIV Prevention: AI-Assisted Spatial Analysis and Decision Support. (Under review)

Peer-reviewed journals

2026:

- **Lessani, M. N.,** Li, Z., Yu, M., Greatrex, H., Chen, C., 2026. Spatially Varying Coefficient Models in Spatial Statistics: A Comprehensive Review and Synthesis. *Annals of GIS*, pp.1–35. <https://doi.org/10.1080/19475683.2026.2714765>
- **Lessani, M. N.,** Li, Z., Qiao, S., Yu, M., and Li, X., 2026. Spatial variations in the association between gay bar visitation and HIV prevalence across six major U.S. cities using large-scale human mobility data. *Geo-Spatial Information Science*, pp.1-14. <https://doi.org/10.1080/10095020.2026.2686898>
- Khosravi Kazazi, A., Li, Z., **Lessani, M.N.,** and Cervone, G., 2026. From questions to queries: an AI-powered multi-agent framework for spatial text-to-Sql. *International Journal of Digital Earth*, 19(2), p.2687193. <https://doi.org/10.1080/17538947.2026.2687193>
- Jing, F., Li, T., Li, Z., **Lessani, M.N.,** Hu, J., He, G., Hu, J., Liu, T. and Ma, W., 2026. A multi-network spatial error workflow for disentangling digital connectivity and geographic spillovers: evidence from sexually transmitted infections. *International Journal of Geographical Information Science*, pp.1-25. <https://doi.org/10.1080/13658816.2026.2680021>
- Sui, Z., and **Lessani, M.N.,** 2026. Towards Cartographic Design Pluralism: Centering Non-Latin Typographic Practices in Digital Mapping. *GeoHumanities*, pp.1-17. <https://doi.org/10.1080/2373566X.2026.2631449>

- Kaur, M.N., Jain, M., Dey, T., Huerta, D.T., Meyers, P., Zeng, C., Dragonetti, B.M., DeAngelo, M.R., Schuster, C., **Lessani, M.N.** and Li, Z., 2026. Understanding determinants of patient-reported outcome measure non-response among transgender and gender diverse individuals: an intersectional multilevel analysis of sociodemographic and structural vulnerabilities. *Quality of Life Research*, 35(8), p.212. <https://doi.org/10.1007/s11136-026-04207-x>
- Akinboyewa, T., Ning, H., Li, Z., **Lessani, M. N.**, Li, X., and Qiao, S., 2025. Exploring the role of place visitation big data on small area health measure estimation. *Computational Urban Science* (In press).

2025:

- **Lessani, M.N.**, N'Diaye, A., Li, Z. Li, X. Qiao S., 2025. Chlamydia and gonorrhea incidence and residential segregation: US spatiotemporal patterns (2013–2021). *BMC Public Health* 25, 3594. <https://doi.org/10.1186/s12889-025-24798-3>
- Robert, B.N., Macharia, P.M., **Lessani, M.N.**, Chepkurui, V., Kamau, J., Snow, R.W., Li, Z. and Okiro, E.A., 2025. Spatially varying relationships between birth registration and influencing factors in Kenya, using a suite of Geographically Weighted Regressions. *Spatial and Spatio-temporal Epidemiology*, p.100764. <https://doi.org/10.1016/j.sste.2025.100764>
- Sui, Z., & **Lessani, M. N.**, 2025. Design Principles of Kashida Justification: A Unique Technique in Arabic and Persian Mapping. *Cartographic Perspectives*, (107). <https://doi.org/10.14714/CP107.2055>
- **Lessani, M.N.** and Li, Z., 2025. Enhancing the computational efficiency of the SGWR model and introducing its software implementation. *Annals of GIS*, pp.1-16. <https://doi.org/10.1080/19475683.2025.2523739>
- Zeng, C., **Lessani, M.N.**, Liu, J.B., Jarman, M.P., Ufere, N.N., Lau-Min, K.S., Meyers, P.M., Qiao, S., Bryant, A.S., Kaur, M.N. and Pusic, A.L., 2025. Impacts of Residential Segregation and Comorbidity on Racial Disparities in Acute Care Utilization. *Journal of Racial and Ethnic Health Disparities*, pp.1-10. <https://doi.org/10.1007/s40615-025-02574-8>
- Ning, H., Li, Z., Akinboyewa, T. and **Lessani, M.N.**, 2025. An autonomous GIS agent framework for geospatial data retrieval. *International Journal of Digital Earth*, 18(1), p.2458688. <https://doi.org/10.1080/17538947.2025.2458688>
- Akinboyewa, T., Li, Z., Ning, H., **Lessani, M.N.**, Holmes, L.M. and Qiao, S., 2025. Exploring the association between smartphone-based place visitation data and neighborhood-level coronary heart disease in the United States. *PloS one*, 20(8), p.e0329455. <https://doi.org/10.1371/journal.pone.0329455>
- Akinboyewa, T., Li, Z., Ning, H. and **Lessani, M. N.**, 2025. GIS Copilot: towards an autonomous GIS agent for spatial analysis. *International Journal of Digital Earth*, 18(1), p.2497489. <https://doi.org/10.1080/17538947.2025.2497489>

2024:

- **Lessani, M. N.** and Li, Z., 2024. SGWR: similarity and geographically weighted regression. *International Journal of Geographical Information Science (IJGIS)*, pp.1-24. <https://doi.org/10.1080/13658816.2024.2342319> (**Most read article in IJGIS for 2024**)
- **Lessani, M. N.**, Li, Z., Deng, J. and Guo, Z., 2024. An MPI-based parallel genetic algorithm for multiple geographical feature label placement based on the hybrid of fixed-sliding models. *Geospatial Information Science*, pp.1-19. <https://doi.org/10.1080/10095020.2024.2313326>

- Li, Z., Ning, H., Jing, F. and **Lessani, M. N.**, 2024. Understanding the bias of mobile location data across spatial scales and over time: a comprehensive analysis of SafeGraph data in the United States. *Plos one*, 19(1), p.e0294430. <https://doi.org/10.1371/journal.pone.0294430>
- Jing, F., Li, Z., Qiao, S., Ning, H., **Lessani, M. N.** and Li, X., 2024. From neighborhood contexts to human behaviors: Cellphone-based place visitation data contribute to estimating neighborhood-level depression prevalence in the United States. *Cities*, 148, p.104905. <https://doi.org/10.1016/j.cities.2024.104905>
- Akinboyewa, T., Ning, H., **Lessani, M. N.** and Li, Z., 2024. Automated floodwater depth estimation using large multimodal models for rapid flood mapping. *Computational Urban Science*, 4(1), p.12. <https://doi.org/10.1007/s43762-024-00123-3>
- Jing, F., Li, Z., Qiao, S., **Lessani, M. N.**, Ning, H., Ma, W., Hu, J., Yang, P. and Li, X., 2024. Optimizing county-level infectious respiratory disease forecasts: a pandemic case study integrating social media-based physical and social connectivity networks. *International Journal of Digital Earth*, 17(1), p.2436486. <https://doi.org/10.1080/17538947.2024.2436486>

2020-2023:

- **Lessani, M. N.**, Li, Z., Jing, F., Qiao, S., Zhang, J., Olatosi, B. and Li, X., 2023. Human mobility and the transmission of infectious disease: a systematic review. *Geo-Spatial Information Science*, pp.1-28. <https://doi.org/10.1080/10095020.2023.2275619>
- **Lessani, M. N.**, Deng, J. and Guo, Z., 2021. A Novel Parallel Algorithm with Map Segmentation for Multiple Geographical Feature Label Placement Problem. *ISPRS International Journal of Geo-Information*, 10(12), p.826. <https://doi.org/10.3390/ijgi10120826>
- Deng, J., Guo, Z. and **Lessani, M. N.**, 2021. Multiple geographical feature label placement based on multiple candidate positions in two degrees of freedom space. *IEEE Access*, 9, pp.144085-144105. [10.1109/ACCESS.2021.3120289](https://doi.org/10.1109/ACCESS.2021.3120289)
- Lei, Y., Deng, J., Lin, J., Dick, J.M., **Lessani, M. N.** and Liu, C., 2020. Research of automatic generation for engineering geological survey reports based on a four-dimensional dynamic template. *ISPRS International Journal of Geo-Information*, 9(9), p.496. <https://doi.org/10.3390/ijgi9090496>

Under review:

- **Lessani, M. N.**, Li, Z., Akinboyewa, T., Jing, F., 2026. Place-based Representation Bias in Human Mobility Data: Assessing POI Coverage, Category Bias, and Visitor Representation Bias. *Annals of the American Association of Geographers* (Under review)
- **Lessani, M. N.**, Li, Z., 2026. Beyond Geographic Proximity: The Role of Attribute Similarity in Multiscale Local Regression Models. *International Journal of Geographical Information Science* (Under review)
- **Lessani, M. N.**, Li, Z., and Chen, C., 2025. Leveraging Large-Scale Human Mobility Data for Lung Cancer Research: A Census Tract Level Case Study in Pennsylvania. *PLOS One* (In press)
- Jing, F., Li, Z., **Lessani, M. N.**, 2026. Functional compression of urban destination systems under extreme heat. *Nature Cities* (Under review)
- Liu, R., Lim, S., **Lessani, M. N.**, Li, Z., 2026. Exploring tract-level human mobility adaptation to heatwaves in contiguous United States using mobile location data (2018–2022). *Computers, Environment and Urban Systems* (Under review)

- **Lessani, M. N.**, Li, Z., Yu, M., Greatrex, H., Shen, C., 2025. Multiscale Similarity and Geographically Weighted Regression (M-SGWR). Geographical Analysis (Second round of review)
- Hwang, G., Yang, Y., **Lessani, M. N.**, 2025. When crowds converge: Examining the nuanced relationship between planned events and crime. Journal of Travel Research (Second round of review)

In the process of submission:

- **Lessani, M. N.**, Li, Z., Qiao, S., Li, X., 2025. Analyzing Travel Distances to Gay Bars from Residential Areas Using Large-Scale Human Mobility Data Across Four Major U.S. Cities. (In outline stage)

CONFERENCE PRESENTATIONS:

Presented by the first author unless otherwise noted

2026

- Participated in Esri User Conference in San Diego, CA, (7/13/2026 – 7/16/2026)
- Multiscale Similarity-based Geographically Weighted Regression (M-SGWR). AAG Annual Meeting, March 20th, 2026, San Francisco, CA, USA (**Lessani M. N.**, Li Z)

2025

- Chlamydia and Gonorrhea Incidence and Residential Segregation: US Spatiotemporal Patterns. Department of Geography, The Pennsylvania State University. Coffee Hour, November 7, 2025 (**Lessani, M.N.**, N'Diaye, A., Li, Z. Li, X. Qiao S)
- Leveraging Large-Scale Human Mobility Data for Lung Cancer Research: A Census Tract–Level Case Study in Pennsylvania, USA. Animal, Veterinary, and Biomedical Sciences Building, Pennsylvania State University (Cancer Research Day), October 18, 2025 (**Lessani M. N.**, Li Z, Shen C)
- How To Accurately Capture and Measure Dynamic Spatial Dependency? College of Earth and Mineral Science, Geography, Pennsylvania State University, No Boundaries Symposium, May 3rd, 2025 (**Lessani M. N.**, Li Z)
- Enhancing Computational Efficiency of The SGWR Model and Introducing Its Software Implementation. AAG Annual Meeting, March 28, 2025, Detroit, Michigan (**Lessani M. N.**, Li Z)
- GIS Copilot: Towards an Autonomous GIS Agent for Spatial Analysis. AAG Annual Meeting, March 27, 2025, Detroit, Michigan (**Akinboyewa, T.**, Li, Z., Ning, H., & **Lessani, M. N.**); Akinboyewa, T (presenter).
- An autonomous GIS agent framework for geospatial data retrieval. AAG Annual Meeting, March 27, 2025, Detroit, Michigan (**Ning, H.**, Li, Z., Akinboyewa, T. and **Lessani, M.N.**); Ning, H (presenter)
- Leveraging Large Language Models for Systematic Reviewing: A Case Study Using HIV Medication Adherence Research. At 6th National Big Data Health Science Center Conference, February 15, 2025, Columbia, South Carolina (**Lessani, M. N.**, Li, Z., Qiao, S., Ning, H., et al)
- Exploring the association between smartphone-based place visitation data and neighborhood-level coronary heart disease in the United States. At 6th National Big Data Health Science Center

Conference, February 14, 2025, Columbia, South Carolina (**Akinboyewa, T.**, Li, Z., Ning, H., **Lessani, M.N.**, Holmes, L.M. and Qiao, S); Akinboyewa, T (presenter).

2024

- SGWR: Similarity And Geographically Weighted Regression. AAG Annual Meeting, April 20th, 2024, Honolulu, Hawaii (**Lessani M. N.**, Li Z)
- Enhancing Computational Efficiency of The SGWR Model and Introducing Its Software Implementation. AAG Middle State, November 1st, 2024, West Chester University, Pennsylvania (**Lessani M. N.**, Li Z)
- Elaboration On the Three Laws of Geography and What Comes Next? At the AAG mini conference at Penn State University, April 20th, 2024, Pennsylvania (**Lessani M. N.**, **Li Z**)
- An MPI-Based Parallel Genetic Algorithm for Multiple Geographical Feature Label Placement Based on The Hybrid of Fixed-Sliding Models. At the coffee hour, Penn State University, February 25th, 2024, Pennsylvania (**Lessani M.N.**, Li, Z., Deng, J. and Guo, Z)
- SGWR: Similarity And Geographically Weighted Regression. GIS Day Lighting Talk at Penn State University, November 18, 2024, Pennsylvania (**Lessani M. N.**, Li Z)
- Leveraging Large Language Models for Systematic Reviewing: A Case Study Using HIV Medication Adherence Research. At 5th National Big Data Health Science Center Conference, February 2, 2024, Columbia, South Carolina (**Lessani M. N.**, Li, Z., Qiao, S., Ning, H., et al)
- Automated floodwater depth estimation using large multimodal models for rapid flood mapping. AAG Middle State, November 1st, 2024, West Chester University, Pennsylvania (**Akinboyewa, T.**, Ning, H., **Lessani, M. N.** and Li, Z); Akinboyewa, T (presenter)

2023

- A Novel Parallel Algorithm with Map Segmentation for Multiple Geographical Feature Label Placement Problem. AAG Annual Meeting, March 25, 2023, Denver, Colorado (**Lessani M. N.**, Deng, J. and Guo, Z)
- Human Mobility and The Transmission of Infectious Disease. At 4th National Big Data Health Science Center Conference, February 11, 2023, Columbia, South Carolina (**Lessani, M. N.**, Li, Z., Jing, F., Qiao, S., Zhang, J., Olatosi, B. and Li, X)
- Optimizing county-level infectious respiratory disease forecasts: a pandemic case study integrating social media-based physical and social connectivity networks. AAG Annual Meeting, March 24, 2023, Denver, Colorado (**Jing, F.**, Li, Z., Qiao, S., **Lessani, M. N.**, Ning, H., Ma, W., Hu, J., Yang, P. and Li, X.); Jing F (presenter)

ORGANIZED AND CHAIRED CONFERENCES SESSIONS:

- Symposium on Spatial AI and Data Science: Harnessing Geospatial Big Data for Infectious Diseases, AAG Annual Meeting, 2026, (co-organized with Zhenlong Li, Kathleen Stewart).
- Symposium on Spatial AI and Data Science: Social Sensing and Big Data Computing for Disaster Management, AAG Annual Meeting, 2026, (co-organized with Zhenlong Li, Xiao Huang, Yuqin Jiang, Qunying Huang).
- Symposium on Spatial AI and Data Science: Integrative Approaches to Understanding Human Mobility and Health Outcomes, AAG Annual Meeting, 2026, (co-organized with Temitope Akinboyewa, Zhenlong Li, Huan Ning, Khosravi Kazazi, Ali, Ruixiang Liu).

- Symposium on Spatial AI and Data Science: Geospatial Big Data for Analyzing and Understanding Human Mobility Patterns, AAG Annual Meeting, 2026, (co-organized with Sooyoung Lim, Zhenlong Li, Yuqin Jiang, Manzhu Yu).
- Geospatial Big Data for Analyzing and Understanding Human Mobility Patterns, AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Zhenlong Li, Huan Ning, Temitope Ezekiel Akinboyewa, Manzhu Yu)
- Harnessing Geospatial Big Data for Infectious Diseases, AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Zhenlong Li, Huan Ning, Temitope Ezekiel Akinboyewa, Manzhu Yu)
- Social Sensing and Big Data Computing for Disaster Management (1 session), AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Zhenlong Li, Huan Ning, Qunying Huang, Bandana Kar)
- Urban Sensing and Understanding via Geospatial Big Data and AI, AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Zhenlong Li, Temitope Ezekiel Akinboyewa, Huan Ning, Manzhu Yu)
- Leveraging Generative Artificial Intelligence for Enhanced Disaster Management, AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Temitope Ezekiel Akinboyewa, Zhenlong Li, Huan Ning, Manzhu Yu)
- Integrative Approaches to Understanding Human Mobility and Health Outcomes, AAG Annual Meeting, March 24-28, 2025, Detroit (co-organized with Temitope Ezekiel Akinboyewa, Zhenlong Li, Huan Ning, Manzhu Yu)
- Geospatial Big Data for Analyzing and Understanding Human Mobility Patterns, AAG Annual Meeting, April 16-20, 2024, Honolulu (co-organized with Huan Ning., Li Z., Akinoyewa T., Yu M.)
- Social Sensing and Big Data Computing for Disaster Management, AAG Annual Meeting, April 16-20, 2024, Honolulu (co-organized with Li Z., Huan Ning., Huang Q., Kar B.)
- Integrative Approaches to Understanding Human Mobility and Health Outcomes, AAG Annual Meeting, April 16-20, 2024, Honolulu (co-organized with Akinoyewa T., Huan Ning., Li Z., Yu M.)
- Urban Sensing and Understanding via Geospatial Big Data and AI, AAG Annual Meeting, April 16-20, 2024, Honolulu (co-organized with Li Z., Akinoyewa T., Huan Ning., Yu M.)
- Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions: Human Mobility Analytics in Big Data Era, AAG Annual Meeting, March 23-27, 2023, Denver (co-organized with Huan Ning., Li Z.)
- Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions: Social Sensing and Big Data Computing for Disaster Management, AAG Annual Meeting, March 23-27, 2023, Denver (co-organized with Li, Z., Huan Ning., Huang Q., Emrich C.)

PROFESSIONAL MEMBERSHIP:

- American Association of Geographers (AAG)
- Cartography and Geographic Information Society (CaGIS)
- PoliMappers YouthMappers (Politecnico di Milano, Italy)
- Cyberinfrastructure Specialty Group in AAG
- Penn State Cancer Institute (PSCI) Affiliate Membership Program
- Esri Young Professionals Network (YPN) Member

PROFESSIONAL SERVICES**Leadership:**

- Student Director of Cyberinfrastructure Specialty Group in AAG (2025-2026)
- Geography Graduate Student Representative on the Graduate Student Council, Penn State University (Fall 2025 to Fall 2026)
- Graduate Student Representative, Penn State Department of Geography (2025)

Special issue topic coordinator:

- Frontiers in Human Dynamics Journal “Exploring Human Mobility Dynamics: Causes and Implications with Geospatial Big Data Insights”

Reviewer in these journals:

- International Journal of Geographical Information Science (IJGIS)
- Annals of American Association of Geographers
- International Journal of Digital Earth
- International Journal of Applied Earth Observation and Geoinformation
- Annals of GIS
- PLOS One
- International Journal of Geo-Information
- Frontiers in Human Dynamics Journal
- Frontiers in Sociology, section Migration and Society
- Annals of GIS
- Spatial and Spatio-temporal Epidemiology
- Sustainable Cities and Society: Advances
- Journal of Urban Health

MENTORSHIP

- Zhaoxu Sui (PhD student, Penn State University)
- Sooyoung Lim (PhD student, Penn State University)
- Carissa Mobley (undergraduate student, Penn State University, summer school, 2025)
- Ali Hussiani (master’s student, Kabul Polytechnic University) (Remotely)
- Omid Azimi (master’s student, Kabul Polytechnic University) (Remotely)

KEY TECHNICAL SKILLS

Autonomous GIS Agent Development | Generative AI in Spatial Analysis | Geospatial Big Data Analysis | Parallel Computing | Algorithm Developer | Python | SQL | STATA | ArcGIS Pro | ArcGIS Online | ArcGIS Desktop | QGIS | AutoCAD | Civil 3D

SOFTWARE PRODUCTS

- Developed a Graphical User Interface (GUI) tool (<https://github.com/Lessani252/FastSGWR>)
- Developed and published a Python package (available on PyPI) for our spatial modeling framework
- Developed a Multiscale Spatial Regression Model (<https://github.com/Lessani252/M-SGWR>)
- GIS Copilot Plugin Tool for QGIS (co-author)
- Geospatial Data Retrieval Plugin Tool for QGIS (co-author)