

Wenbo Lv

undergraduate

Curriculum Vitae

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Some stuff about me

- My research interests lie in **advancing methodologies in spatial causal inference** and **developing high-performance computational tools**, with a primary focus on *R packages*.
- Currently, my work centers on **Empirical Dynamic Modeling (EDM)** framework for modeling *dynamic system* and **Difference-in-Differences (DID)** methods for *event studies*. I am particularly interested in leveraging these approaches to address critical challenges in *urban sustainability*, *climate change mitigation*, and broader global issues.
- I possess expertise in *data analysis*, *statistical modeling*, and the development of *R packages* and open-source analytical tools utilizing **R**, **C++**, and **Python**.
- I have contributed to the **development** and **maintenance** of several open-source spatial analysis tools within the R community and remain dedicated to **advancing open-source geospatial analysis software**.

Education

2021-2025	BSc In Geographic Information Science Xi'an, Shaanxi	Shaanxi Normal University
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Publications

1. Lv, W., Lei, Y., Liu, F., Yan, J., Song, Y., & Zhao, W. (2025). Gdverse: An r package for spatial stratified heterogeneity family. *Transactions in GIS*, 29(2), 29:e70032. <https://doi.org/10.1111/tgis.70032>
2. Lv, W., Liu, F., Cai, K., Cao, Y., Deng, M., Liang, W., Yan, J., & Wang, G. (2024). Distinguishing the impacts and gradient effects of climate change and human activities on vegetation cover in the weihe river basin, china. *Journal of Geophysical Research: Biogeosciences*, 129(10). <https://doi.org/10.1029/2024jg008297>
3. Chen, C., Song, Y., Lv, W., Shemery, A., Hampson, K., Yi, W., Zhong, Y., & Wu, P. (2025). Predicting pavement cracking performance using laser scanning and geocomplexity-enhanced machine learning. *Computer-Aided Civil and Infrastructure Engineering*. <https://doi.org/10.1111/mice.13489>
4. Song, Z., Liu, F., Lv, W., & Yan, J. (2023). Classification of urban agricultural functional regions and their carbon effects at the county level in the pearl river delta, china. *Agriculture*, 13(9). <https://doi.org/10.3390/agriculture13091734>
5. Song, Z., Liu, F., & Lv, W. (2023). *Spatiotemporal characteristics and optimization strategies of urban-rural development disparities in china's urban agglomerations(in chinese)* (pp. 1418–1429). People's Cities, Empowered by Planning - Proceedings of the 2023 China Urban Planning Annual Conference (14 Regional Planning; Urban Economy). <https://link.cnki.net/doi/10.26914/c.cnkihy.2023.061565>

Honor

2024.12	Longi Non-Education Major Scholarship
2024.11	First Prize in the 13th National University Student GIS Application Skills Competition
2024.06	National University Student Innovation and Entrepreneurship Training Program Qualified Completion
2023.12	Grand Prize in the 12th National University Student GIS Application Skills Competition
2023.11	First Prize in the Second National University Student Ecological Environment Management Research Innovation Competition
2023.12	Second Prize of the 5th 'Guodi Cup' National College Student Natural Resource Science and Technology Competition, China Society of Natural Resources
2021.10	Outstanding Individual in Military Training Publicity for College Students, Shaanxi Normal University

Unpublished

First Author	Measuring causal associations by geographical cross mapping cardinality	Submitted to IJGIS, currently under review
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Third Author	Agricultural policies reshape cropland patterns with varying impacts - a case of soybeans from Heilongjiang Province Submitted to Land Use Policy, currently under review	
First Author	Decomposing spatial causality through mutual information	Plan
First Author	On the role of explicit spatial information in stratified heterogeneity	Plan
First Author	Geocomplexity Mitigates Spatial Bias	Plan

Developed Spatial Analysis Toolkit

Package	Description	Source Code	Language
spEDM	Spatial Empirical Dynamic Modeling	https://github.com/stscl/spEDM	C++, R
gdverse	Analysis of Spatial Stratified Heterogeneity	https://github.com/stscl/gdverse	R, C++, Python
itmsa	Information-Theoretic Measures for Spatial Association	https://github.com/stscl/itmsa	C++, R
sdsfun	Spatial Data Science Complementary Features	https://github.com/stscl/sdsfun	R, C++
geocomplexity	Mitigate Spatial Bias Through Geographical Complexity	https://github.com/ausgis/geocomplexity	C++, R, C
HSAR	Hierarchical Spatial Autoregressive Model	https://github.com/spatlyu/hsar	C++, R
GD	Geographical Detectors for Assessing Spatial Factors	https://github.com/ausgis/GD	R
sesp	Spatially Explicit Stratified Power	https://github.com/stscl/sesp	R, C++
cisp	A Correlation Indicator Based On Spatial Patterns	https://github.com/stscl/cisp	R
geosimilarity	Geographically Optimal Similarity	https://github.com/ausgis/geosimilarity	R
geocn	Loads Spatial Data Sets of China	https://github.com/stscl/geocn	R
figpatch	Easily Arrange External Figures with Patchwork Alongside 'ggplot2' Figures	https://github.com/spatlyu/figpatch	R
qgisprocess	R package to use QGIS processing algorithms	https://github.com/r-spatial/qgisprocess	R
spEcula	Spatial Prediction Methods In R	https://github.com/SpatLyu/spEcula	R
tidyrgeoda	A tidy interface for rgeoda	https://github.com/SpatLyu/tidyrgeoda	R