Wenbo Lv

undergraduate

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SpatLyu
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Curriculum Vitae
Friday 4th April, 2025

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** Shaanxi Normal University
Xi'an, Shaanxi

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. 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
4. 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** Pending submission
First Author **On the role of explicit spatial information in stratified heterogeneity** In writing
First Author **Geocomplexity Mitigates Spatial Bias** In writing

In research

Leader **Extract Urban Spatial Boundaries in Xi'an City Using Deep Learning**
Utilized advanced spatial sampling methods and unsupervised algorithms to automatically generate sample sets. Employed geographically weighted neural networks combined with logistic regression to extract urban spatial boundaries

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
GD	Geographical Detectors for Assessing Spatial Factors	https://github.com/ausgis/GD	R
sdsfun	Spatial Data Science Complementary Features	https://github.com/stscl/sdsfun	R, C++
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
geocomplexity	Mitigate Spatial Bias Through Geographical Complexity	https://github.com/ausgis/geocomplexity	C++, R, C
geosimilarity	Geographically Optimal Similarity	https://github.com/ausgis/geosimilarity	R
geocn	Loads Spatial Data Sets of China	https://github.com/stscl/geocn	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