

# Wenbo Lv

undergraduate

## Curriculum Vitae

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## Some stuff about me

- I am passionate about **developing innovative spatial analysis methods** that leverage **spatial relationships**, such as *spatial dependence*, *spatial heterogeneity*, and *geographical similarity*, to advance *urban sustainability* and *climate change mitigation* efforts.
- 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 | <b>BSc In Geographic Information Science</b><br>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. 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                     | <a href="https://github.com/stscl/spEDM">https://github.com/stscl/spEDM</a>                     | C++, R         |
| gdverse       | Analysis of Spatial Stratified Heterogeneity           | <a href="https://github.com/stscl/gdverse">https://github.com/stscl/gdverse</a>                 | R, C++, Python |
| itmsa         | Information-Theoretic Measures for Spatial Association | <a href="https://github.com/stscl/itmsa">https://github.com/stscl/itmsa</a>                     | C++, R         |
| GD            | Geographical Detectors for Assessing Spatial Factors   | <a href="https://github.com/ausgis/GD">https://github.com/ausgis/GD</a>                         | R              |
| sdsfun        | Spatial Data Science Complementary Features            | <a href="https://github.com/stscl/sdsfun">https://github.com/stscl/sdsfun</a>                   | R, C++         |
| sesp          | Spatially Explicit Stratified Power                    | <a href="https://github.com/stscl/sesp">https://github.com/stscl/sesp</a>                       | R, C++         |
| cisp          | A Correlation Indicator Based On Spatial Patterns      | <a href="https://github.com/stscl/cisp">https://github.com/stscl/cisp</a>                       | R              |
| geocomplexity | Mitigate Spatial Bias Through Geographical Complexity  | <a href="https://github.com/ausgis/geocomplexity">https://github.com/ausgis/geocomplexity</a>   | C++, R, C      |
| geosimilarity | Geographically Optimal Similarity                      | <a href="https://github.com/ausgis/geosimilarity">https://github.com/ausgis/geosimilarity</a>   | R              |
| geocn         | Loads Spatial Data Sets of China                       | <a href="https://github.com/stscl/geocn">https://github.com/stscl/geocn</a>                     | R              |
| qgisprocess   | R package to use QGIS processing algorithms            | <a href="https://github.com/r-spatial/qgisprocess">https://github.com/r-spatial/qgisprocess</a> | R              |
| spEcula       | Spatial Prediction Methods In R                        | <a href="https://github.com/SpatLyu/spEcula">https://github.com/SpatLyu/spEcula</a>             | R              |
| tidyrgeoda    | A tidy interface for rgeoda                            | <a href="https://github.com/SpatLyu/tidyrgeoda">https://github.com/SpatLyu/tidyrgeoda</a>       | R              |