# Wenbo Lv

*undergraduate*

## 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 **BSc In Geographic Information Science**, *Shaanxi Normal University*, Xi'an, Shaanxi.

## Publications

1. 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
2. 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
3. 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

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**.

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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**.

2024.06 **National University Student Innovation and Entrepreneurship Training Program Qualified Completion**.

## Unpublished

First Author **gdverse: An R package for spatial stratified heterogeneity family**, *Submitting to TGIS*.

First Author **On the role of explicit spatial information in stratified heterogeneity**, *Writing in progress, planning to submit to AAAG*.

First Author **A correlation indicator based on spatial patterns**, *Writing in progress, planning to submit to IJGIS*.

First Author **Geocomplexity Mitigates Spatial Bias**, *Writing in progress, planning to submit to IJGIS*.

## 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

- **gdverse**
  Provides tools for analyzing *Spatial Stratified Heterogeneity* (SSH), integrating advanced statistical methods to assess spatial patterns effectively. Developed using **R**, **C++**, and **Python**.
- **sesp**
  Implements the *Spatially Explicit Stratified Power* model, a robust framework for spatial analysis combining stratification and statistical power. Written in **R** and **C++**.
- **geocomplexity**
  Focuses on mitigating spatial biases by leveraging geographical complexity. Combines computational efficiency with flexibility, developed in **C++**, **R**, and **C**.
- **cisp**

Introduces a novel *Correlation Indicator Based on Spatial Patterns* for measuring spatial correlations with high precision. Written in **R**.

- **geosimilarity**
  Provides methods for calculating *Geographically Optimal Similarity*, enabling better spatial predict. Developed in **R**.
- **GD**
  Implements *Geographical Detectors*, a toolkit for assessing spatial factors influencing heterogeneity. Fully developed in **R**.
- **sdsfun**
  Adds complementary features for *Spatial Data Science*, providing user-friendly functionalities for geospatial research. Developed using **R** and **C++**.
- **geocn**
  Simplifies the process of loading and managing spatial datasets of China, supporting research with localized datasets. Developed in **R**.
- **qgisprocess**
  Offers an **R** interface to *QGIS processing algorithms*, enabling seamless integration of QGIS functionalities into R workflows.
- **spEcula**
  Provides advanced methods for *Spatial Prediction* in **R**, supporting applications ranging from environmental modeling to spatial econometrics.
- **tidyrgeoda**
  Offers a tidy interface for *rgeoda*, bridging geospatial analysis and tidyverse workflows to streamline data handling and modeling in **R**.

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