

Siyu Wu · 伍斯宇

Forest remote sensing and structural ecology researcher studying how three-dimensional forest structure and light-resource heterogeneity shape biodiversity and species coexistence.

Research interests

- Forest structural complexity and near-surface remote sensing
- Biodiversity, light-resource heterogeneity and community assembly
- Spatial statistics and reproducible ecological workflows
- Digital tools for long-term forest monitoring

Education

2020–2026 · East China Normal University, Shanghai

Integrated MSc–PhD programme in Ecology, School of Ecological and Environmental Sciences. Dissertation research: effects of complex three-dimensional forest structure and its mediation of light resources on plant diversity patterns.

2015–2019 · Shanghai Normal University, Shanghai

BSc in Biological Sciences, College of Life Sciences. Undergraduate research on bryophyte species–area relationships.

Research and project experience

Forest structure, light and biodiversity · 2020–2026

- Integrated LiDAR remote sensing, three-dimensional radiative-transfer modelling and forest-observation data.
- Investigated general relationships between forest structural complexity and biodiversity.
- Examined how species differentiation along light niches contributes to coexistence.

Tiantong forest dynamics plot · 2024–2025

- Coordinated data integration and quality control for the third census of the 20-ha evergreen broad-leaved forest dynamics plot.
- Contributed to the application of a QField-based paperless survey workflow.
- Developed data validation procedures supporting reliable field records.

Multi-site forest remote-sensing campaigns · 2020–2026

- Participated in UAV and LiDAR data collection and processing across forest sites in China.
- Supported long-term monitoring by linking field observations with multi-source remote-sensing data.

National and protected-area projects · 2023–2026

- Participated in the National Key Research and Development Program project on protection and restoration of vulnerable ecosystems (2024YFF1308100).
- Provided survey and geospatial support for the Baishanzu National Park project (2023JBGS01).
- Contributed to digital census workflows for the Tiantong and Baishanzu forest dynamics plots.

Selected publications

1. Liang, X., Wang, Y., Pan, J., et al., **Wu, S.**, et al. (2026). [Empowering tree-scale monitoring over large areas: Individual tree delineation from high-resolution imagery](#). *ISPRS Journal of Photogrammetry and Remote Sensing*.
2. Li, G., Wu, B., Yang, L., et al., **Wu, S.**, et al. (2025). [QuadrantSearch: A Novel Method for Registering UAV and Backpack LiDAR Point Clouds in Forested Areas](#). *IEEE Transactions on Geoscience and Remote Sensing*.
3. Jin, C., Yang, J., **Wu, S.**, et al. (2025). [Canopy height and stand density mask nature's inherent synergy between forest structural complexity and diversity](#). *Journal of Plant Ecology*.
4. Li, S., Yao, J., Lin, Y., **Wu, S.**, et al. (2025). [Bias in Discontinuous Elevational Transects for Tracking Species Range Shifts](#). *Plants*.

See [Publications](#) for the complete list and available PDFs.

Selected software and open project

[Think Like a Forest](#) · Creator and developer

A browser-based forest-succession strategy game translating ecological trade-offs into an interactive system. Built with TypeScript, Phaser and ECharts, with model tests, browser tests and simulation-data export. [\[Source\]](#)

Skills

- **Analysis:** R, Python, spatial statistics, ecological modelling and visualisation
- **Remote sensing:** UAV surveys, QGIS, QField, CloudCompare and LAStools
- **Research engineering:** Git, SQLite, reproducible data workflows and quality control
- **Communication:** scientific writing, Quarto, R Markdown, Markdown, LaTeX and Office
- **Languages:** Chinese (native), English (CET-6; academic writing and conference communication)

Teaching and service

- High-school biology instructor, Shanghai New Nanyang Only Education Technology Co., Ltd., 2019–2020.
- Contributed to team coordination, fieldwork organisation and academic-community activities during doctoral training.

Honours

- Outstanding Student Leader, East China Normal University, 2025
- Champion and team captain, School 3v3 Basketball Tournament, 2022–2023
- Champion, Shanghai Normal University League of Legends Tournament, 2018
- Runner-up, Shanghai Normal University Cantonese Singing Competition, 2018

Contact

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