Yang Mu Ph.D. candidate

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Profile

My research focuses on the intersection of **spatial-temporal analysis**, **multimodal learning**, and **foundation models** for Earth observation, advancing **geospatial reasoning** to extract valuable insights, especially for **global forest and biodiversity monitoring**.

Education

Technical University of Munich Munich, Germany
Ph.D. in Data Science and Earth Observation 2022 - 2026 *(expected)*

- Advisor: Xiaoxiang Zhu. Research focus: Multimodal Learning, Spatiotemporal Analysis, Foundation Models for Remote Sensing

ETH Zurich Zurich, Switzerland
M.Sc.(Exchange) in Geomatics 2021 - 2022

- Advisor: Konrad Schindler. Focus: Computer Vision, Advanced Signal Processing, Machine Learning for Geospatial Data

KTH Royal Institute of Technology Stockholm, Sweden
M.Sc. in Geoinformation 2020 - 2022

- Advisor: Yifang Ban. Focus: Deep Learning in Data Science, Computer Vision for Geospatial Applications

Wuhan University Wuhan, China
B.Eng. in Remote Sensing Science and Technology 2016 - 2020

- Advisor: Shugen Wang. Focus: Digital Image Processing, Remote Sensing Algorithms, Geospatial Analysis

Publications

1. **Yang Mu**, Zhitong Xiong, Yi Wang, Muhammad Shahzad, Franz Essl, Mark van Kleunen, Xiao Xiang Zhu. GlobalGeoTree: A Multi-Granular Vision-Language Dataset for Global Tree Species Classification. 2025. *(Under Review)*
2. **Yang Mu**, Jianhua Guo, Muhammad Shahzad, Xiao Xiang Zhu. National-scale tree species mapping with deep learning reveals forest management insights in Germany. *International Journal of Applied Earth Observation and Geoinformation*, 2025.
3. **Yang Mu**, Muhammad Shahzad, Xiao Xiang Zhu. MPTSNet: Integrating Multiscale Periodic Local Patterns and Global Dependencies for Multivariate Time Series Classification. *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2025.
4. **Yang Mu**, Muhammad Shahzad, Xiao Xiang Zhu. A spectral-spatial-temporal attention network for tree species mapping using DESIS hyperspectral imagery. *No. EGU24-10854. Copernicus Meetings*, 2024.

Projects

Earth Observation Foundation Models for Mine Site Monitoring (MultiMiner)
Horizon Europe 2023.01 - Present

- Developing GMSM (Generic Mine Site Monitoring algorithm) with EO foundation model and temporal attention networks to address limited in-situ data
- Applied multi-modal approach (Sentinel-2 time series + EnMAP hyperspectral imagery) to vegetation monitoring tasks
- Achieved significant performance improvements over traditional methods in species richness, leaf area index, and fractional vegetation cover prediction
- Conducted comprehensive evaluation of satellite foundation models (Prithvi, Presto, ALISE, AnySat) for potential integration into the unified monitoring framework

Skills

Programming: `Python` (PyTorch, TensorFlow, scikit-learn), `C++`, `MATLAB`, `Java`

Tools: Docker, Git, Linux Shell, HPC/Cloud Computing, Google Earth Engine, QGIS, ArcGIS, GDAL/OGR

Languages: Chinese (Native), English (Fluent), German (Intermediate)

Awards and Honors

- **AAAI Student Scholarship**, AAAI Conference, USA 2024.12
- **Erasmus Scholarship**, European Commission 2021.09
- **KTH Scholarship (35/1700)**, KTH Royal Institute of Technology, Sweden 2020.05
- **Excellence Scholarship**, Wuhan University, China 2018 & 2019.10
- **Second Award**, Asia and Pacific Mathematical Contest in Modeling, China 2019.02
- **Outstanding Paper**, High Resolution Earth Observation Conference, China 2018.10
- **Third place prize**, UAV Intelligent Perception Competition, China 2018.08
- **Honorable Mention**, Mathematical Contest in Modeling, USA 2018.03
- **Undergraduate Innovation Grant**, Wuhan University, China 2017.10

Academic Services

Reviewers for: *Remote Sensing*,
IEEE Transactions on Geoscience and Remote Sensing.

Membership: *European Geosciences Union (EGU)*,
Association for the Advancement of Artificial Intelligence (AAAI).