Jialin Sun

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Short Biography

I received my Master's degree in Land Use and Information Technology from China Agricultural University. I am currently a research assistant at the Urban Environmental Monitoring and Modeling laboratory, led by Prof. Xuecao Li. I have a strong interdisciplinary background in remote sensing, geography, agriculture, and artificial intelligence. I have strong research interests in urban sustainability and urban ecology. Specifically, I am studying the visual accessibility of urban greenspaces from buildings of varying heights on a global scale, as well as the generation of high-resolution, hourly land surface temperature products for cities worldwide.

Education

09/2022 – 07/2024 **China Agricultural University**
Master in Land Use and Information Technology
• GPA: 3.61/4 (Rank 2/14)

09/2018 – 06/2022 **Nanjing University of Information Science and Technology**
Bachelor in Remote Sensing Science and Technology
• GPA: 4.09/5.0 or 91.09/100 (Rank 4/23)

Research Interests

- Urban sustainability and ecology
- Urban greenery and urban heat
- Environmental remote sensing
- Land use and land cover mapping
- Multi-source data fusion, time series analysis
- Machine learning, deep learning

Research Experiences

Evaluating the visual accessibility of urban greenspaces from different building heights on a global scale

Supervised independent research ***07/2024 – present***

- Develop an efficient method to calculate the green view index (GVI) of different building heights.
- Evaluate the visual accessibility of urban greenspaces across different cities worldwide.

★ **Duty:** Methodology design, implementation, analysis, writing and reviewing.

Generating a worldwide high spatial resolution hourly land surface temperature product for urban areas

Supervised independent research ***07/2024 – present***

- Develop a high spatial resolution, hourly LST data generation framework using ECOSTRESS LST data, as well as other multi-source datasets.
- Apply the framework globally to generate a valid product.

★ **Duty:** Methodology design, implementation, analysis, writing and reviewing.

Research on Segment Anything Model (SAM)-Assisted remote sensing crop mapping

Independent research ***05/2023 -06/2024***

(1) Enhancing crop mapping through an automated sample generation framework based on SAM

- Evaluate the performance of SAM for crop parcel segmentation using medium-resolution satellite imagery, such as Sentinel-2 and Landsat-8.
- Develop a novel automated sample generation framework based on SAM.

(2) A weakly supervised learning method based on SAM for crop mapping (Master's thesis)

- Use adapters to finetune SAM for crop parcel segmentation in Sentinel-2 images.
- Generate high-quality pseudo labels through finetuned SAM and weak annotations, replacing the labor-intensive process of obtaining pixel-level annotations.
- Apply pseudo labels to train a fully supervised segmentation model for crop mapping.

★ **Duty:** Methodology design, implementation, analysis, writing and reviewing.

Large-scale crop mapping with multi-source satellite images using a spatiotemporal datacube-based deep learning framework

Supervised independent research ***10/2022 – 05/2023***

- Develop a datacube-based framework to conduct large-scale crop mapping.
- Adopt a novel sample extraction technique based on spatiotemporal datacube.
- Fuse GF-1 and Sentinel-2 multi-temporal images by early and late fusion strategies.

★ **Duty:** Implementation, analysis, writing and reviewing.

FY-4 LPW product authenticity validation

Supervised independent research ***10/2021 – 03/2022***

- Validate FY-4 layer precipitable water product using radiosonde data.

★ **Duty:** Implementation and analysis.

Teaching Experiences

GIS Application and Development (China Agricultural University) **2023 Spring**

★ **Duty:** Teach geospatial data processing based on Python.

Publications

In preparation

[1] Quantifying visual accessibility of greenery in urban buildings from a three-dimensional perspective: An empirical approach.

[2] Generating 70 m, hourly, all-weather land surface temperature for urban regions based on ECOSTRESS and reanalysis data.

2024

[1] **Sun J**, Yan S, Yao X, et al. A Segment Anything Model based weakly supervised learning method for crop mapping using Sentinel-2 time series images[J]. International Journal of Applied Earth Observation and Geoinformation, 2024, 133: 104085.

[2] **Sun J**, Yan S, Alexandridis T, et al. Enhancing Crop Mapping through Automated Sample Generation Based on Segment Anything Model with Medium-Resolution Satellite Imagery[J]. Remote Sensing, 2024, 16(9): 1505.

[3] Yan S, Yao X, **Sun J**, et al. TSANet: A deep learning framework for the delineation of agricultural fields utilizing satellite image time series[J]. Computers and Electronics in Agriculture, 2024, 220: 108902.

[4] **Sun J**, Yao X, Yan S, et al. Large-scale crop mapping based on multi-source remote sensing intelligent interpretation: A spatiotemporal data cubes approach[J]. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 2024.

Awards and Honors

- Excellent undergraduate thesis 2022
- First Prize of Academic Scholarship (NUIST) 2019, 2020
- Mary English Scholarship (NUIST) 2019

Skills

- Computer manipulation: Python, MATLAB, IDL, Linux, high-performance computing, Google Earth Engine.
- Software: ArcMap, ArcGIS pro, ENVI, SNAP.

Language

- Mandarin (native)
- English (fluent)