Jialin Sun

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Short Biography

Jialin Sun (孙嘉麟) received his master's degree in Land Use and Information Technology from China Agricultural University. He is currently a research assistant at the Urban Environmental Monitoring and Modeling laboratory, led by Prof. Xuecao Li. He has a strong background in remote sensing, with interdisciplinary expertise spanning geography, agriculture, machine learning, and artificial intelligence. His current research focuses on urban sustainability and urban ecology. Specifically, he is 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. Prior to joining the lab, he worked on crop mapping using deep learning techniques, particularly leveraging visual foundation models.

Education

09/2022 – 06/2024	**China Agricultural University**
	Master in Land Use and Information Technology
	• GPA: 3.61/4 (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 (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.

Generating a worldwide high spatial resolution hourly land surface temperature product

Supervised independent research   *07/2024 – present*

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

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

Independent research   *06/2023 -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.
- Assess the effectiveness of the framework in Henan Province of China and southern Ontario of Canada.

(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 to conduct crop mapping.

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.

FY-4 LPW product authenticity validation

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

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

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] **<u>Sun J</u>**, 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, **<u>Sun J</u>**, 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] **<u>Sun J</u>**, 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 - 2021
- Mary English Scholarship (NUIST)   2019

Skills

- Computer language: Python, MATLAB, IDL, Linux, high-performance computing, Google Earth Engine
- Software: ArcGIS, ENVI, SNAP

English proficiency

- TOEFL: 107 (Reading: 28/Listening: 29/Speaking: 23/Writing: 27)
- Chinese College English Test Band 4 (CET4): 658
- Chinese College English Test Band 6 (CET6): 604