Jialin Sun

Email: jialinsun4815162342@gmail.com

Homepage: https://nick0317sun.github.io/

Short Biography

Jialin Sun has received his master's degree in Land use and information technology at China Agricultural University. He is now working as a research assistant for Prof. Xuecao Li in China Agricultural University. He has a background in remote sensing with interdisciplinary knowledge from geography, agricultural, machine learning and artificial intelligence. Recently, he is currently focusing on the impact of high-resolution green space exposure on different building heights at a global scale, as well as the production of high spatial resolution hourly land surface temperature products worldwide.

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

- Environmental remote sensing
- Land use and land cover mapping
- Multi-source data fusion, time series analysis
- Machine learning, deep learning

Research Experiences

Research on the impact of high-resolution green space exposure on different building heights at a global scale

Supervised independent research   *07/2024 – present*

- Develop an efficient method to calculate the impact of high-resolution green space exposure on different building heights using Google Earth Engine.
- Evaluate the aforementioned impact across different cities worldwide.

Research on the production of worldwide high spatial resolution hourly land surface temperature products

Supervised independent research   *07/2024 – present*

- Develop a high spatial resolution, hourly LST data generation framework using ECOSTRESS LST data and other multi-source data.
- Apply the framework globally to develop a set of high spatial resolution, hourly LST products.

Research on what Segment Anything Model (SAM) can bring to remote sensing domain

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 through the datasets in Henan Province of China and southern Ontario of Canada.

(2) A weakly supervised learning method based on SAM for crop mapping

- Use adapters to finetune SAM for crop parcel segmentation in Sentinel-2 images.
- Generate high-quality pseudo labels through finetuned SAM and point, bounding box and image-level weak annotations. Particularly, an attention-based U-Net network is used to create class activation maps (CAMs) with multi-temporal images.
- 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

[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.

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

updated on 11/08/2024