

Jialin Sun

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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

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| 09/2022 – 06/2024 | China Agricultural University Master in Land use and information technology <ul style="list-style-type: none">• GPA: 3.61/4 (2/14) |
| 09/2018 – 06/2022 | Nanjing University of Information Science and Technology Bachelor in Remote Sensing Science and Technology <ul style="list-style-type: none">• 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

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- [1] **Sun, J.**, Yan, S., Yao, X., Gao, B., Yang, J., 2024. A Segment Anything Model based weakly supervised learning method for crop mapping using Sentinel-2 time series images. Int. J. Appl. Earth Obs. Geoinf. 133, 104085. <http://dx.doi.org/10.1016/j.jag.2024.104085>.
 - [2] **Sun, J.**, Yan, S., Alexandridis, T., Yao, X., Zhou, H., Gao, B., Huang, J., Yang, J., Li, Y., 2024a. Enhancing Crop Mapping through Automated Sample Generation Based on Segment Anything Model with Medium-Resolution Satellite Imagery. Remote Sens. 16, 1505. <http://dx.doi.org/10.3390/rs16091505>.
 - [3] Yan, S., Yao, X., **Sun, J.**, Huang, W., Yang, L., Zhang, C., Gao, B., Yang, J., Yun, W., Zhu, D., 2024. TSANet: A deep learning framework for the delineation of agricultural fields utilizing satellite image time series. Comput. Electron. Agric. 220, 108902. <http://dx.doi.org/10.1016/j.compag.2024.108902>.
 - [4] **Sun, J.**, Yao, X., Yan, S., Xiong, Q., Li, G., Huang, J., 2024c. Large-scale crop mapping based on multi-source remote sensing intelligent interpretation: A spatiotemporal data

cubes approach. IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.

<http://dx.doi.org/10.1109/JSTARS.2024.3428627>.

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