Yu Shen

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EDUCATION BACKGROUNDS

2025-present Postdoctoral Associate. Nicholas School of the Environment, Duke University, USA

2024-2025 Postdoctoral Research Associate. Geospatial Sciences Center of Excellence (GSCE), South Dakota State University, USA

2019-2024 PhD. in Geospatial Science and Engineering, GSCE, South Dakota State University, USA

2017-2019 Master in Cartography and GIS, Institute of Remote Sensing and Digital Earth, CAS, China

2012-2016 Bachelor in Cartography and GIS, China University of Mining and Technology, China

RESEARCH GRANTS

2025-2027 Quantifying and improving PlanetScope reflectance consistency under anisotropy effects by leveraging overpass time variations. NNH24ZDA001N-CESRA, Commercial Satellite Data Earth Science Research and Applications. PI: Zhang, H. K., Co-I: **Shen, Y.**, 2-year $340,992.

INVOLVED PROJECTS

2020-2025 Developing an enhanced geospatial tool for operationally monitoring crop-specific crop progress and growth conditions in near real-time from Geostationary Satellite Observations and Harmonized Landsat-8 and Sentinel-2 Time Series, United States Department of Agriculture (USDA), PI: Xiaoyang Zhang. Role: Investigation, Algorithm Development, Validation

2023-2025 Detection of Species-specific Plant Phenology from Planet-Scope Time Series for Rangeland Management of the Western United States, National Aeronautics and Space Administration (NASA), PI: Xiaoyang Zhang. Role: Data processing, Resources

2019-2021 Maintenance and Refinement of a Global Land Surface Phenology Product from net primary production (NPP) VIIRS for EOS-MODIS Continuity. (NASA), PI: Xiaoyang Zhang. Role: Data processing, Validation

AWARDS and HONORS

2023-2024 SDSU Dr. Fritz Gritzner Outstanding Graduate Geography Student Award

2023-2024 Research Spotlight at South Dakota State University

2015-2016 Excellent Student Scholarship; China University of Mining & Technology

PUBLICATIONS

Published (*corresponding author; † equal contribution)

1. Tran, K., Zhang, X.*, Ye, Y., Henebry, M. G., Friedl, M., **Shen, Y.**, Liu, Y., An, S., Gao, S., 2025, An Insight into Long-Term Continuity in Global Land Surface Phenology: A Comparative Analysis of MODIS and VIIRS Products. ***Remote Sensing of Environment*** (link).
2. Zhang, C.,*, Kerner, b., H., Wang, S., Hao, P., Li, Z., Hunt A. K., Abernethy, J., Zhao, H., Gao, F., Di, L.,*, Guo, G., Liu, Z., Yang, Z., Mueller, R., Boryan, C., Chen, Q., Beeson, C., P., Zhang, H. K., **Shen, Y.**, 2025, Remote sensing for crop mapping: a perspective on present and future crop-specific land cover data products, ***Remote Sensing of Environment*** (link).

3. Ye, Y., Zhang, X.*, Wang, J., Tran, H. K., Liu, Y., **Shen, Y.**, Gao, S., An, S., 2025, Development of an Enhanced Hybrid Piecewise Logistic Model for Detecting Land Surface Phenology in Drylands. ***Remote Sensing of Environment*** (link).
4. Zhang, H. K.*, **Shen, Y.**, Zhang, X., Li, J., Yang, Z., Xu, Y., Zhang, C., Di, L., Roy, D.P., 2025, Robust and timely within-season conterminous United States crop type mapping using Landsat Sentinel-2 time series and the transformer architecture. ***Remote Sensing of Environment*** (link).
5. Gao, S., Zhang, X.*, **Shen, Y.**, Tran H. K., Ye, Y., Liu, Y., 2025, Improvement of land surface phenology monitoring by fusing VIIRS observations with GOES-16/17 ABI time series. ***Remote Sensing of Environment*** (link).
6. Liu, Y., Zhang, X.*, Tran H. K., Ye, Y., **Shen, Y.**, An, S., 2025, Heterogeneous land surface phenology challenges the comparison among PlanetScope, HLS, and VIIRS detections in semi-arid rangelands. ***Agricultural and Forest Meteorology*** (link).
7. Tran H. K., Zhang, X.*, Zhang, H.*, **Shen, Y.**, Ye, Y., Liu Y., Gao, S., An, S., 2025, A transformer-based model for detecting land surface phenology from the Harmonized Landsat and Sentinel-2 time series across the United States. ***Remote Sensing of Environment*** (link).
8. **Shen, Y.***, Zhang, X.*, Tran H. K., Ye, Y., Gao, S., Liu, Y., An, S., 2025, Near real-time crop mapping at field-scale by blending crop phenometrics with growth magnitude from multiple temporal and spatial satellite observations. ***Remote Sensing of Environment*** (link).
9. Gao, S.*, Zhang, X.*, Zhang, H. K., **Shen, Y.**, Roy, P. D., Wang, W., Schaaf, C., 2024, A new constant scattering angle solar geometry definition for normalization of GOES-R ABI reflectance times series to support land surface phenology studies. ***Remote Sensing of Environment*** (link).
10. Liu, Y., Zhang, X.*, **Shen, Y.**, Ye, Y., Gao, S., Tran H. K. 2024, Evaluation of PlanetScope-detected plant-specific phenology using infrared enabled PhenoCam observations in semi-arid ecosystems. ***ISPRS Journal of Photogrammetry and Remote Sensing*** (link).
11. **Shen, Y.***, Zhang, X.*, Gao, S., Zhang, H., Schaaf, C., Wang, W., Ye, Y., Liu, Y., 2024, Analyzing GOES-R ABI BRDF-adjusted EVI2 time series by comparing with VIIRS observations over the CONUS, ***Remote Sensing of Environment*** (link).
12. Román, M.O.*, Justice, C., Paynter, I. *, Boucher, P.B., Devadiga, S., Endsley, A., Erb, A., Friedl, M., Gao, H., Giglio, L., Gray, J.M., Hall, D., Hulley, G., Kimball, J., Knyazikhin, Y., Lyapustin, A., Myneni, R.B., Noojipady, P., Pu, J., Riggs, G., Sarkar, S., Schaaf, C., Shah, D., Tran, K.H., Vermote, E., Wang, D., Wang, Z., Wu, A., Ye, Y., **Shen, Y.**, Zhang, S., Zhang, S., Zhang, X., Zhao, M., Davidson, C., & Wolfe, R. 2024. Continuity between NASA MODIS Collection 6.1 and VIIRS Collection 2 land products. ***Remote Sensing of Environment*** (link).
13. Tran, K.H., Zhang, X.*, Ye, Y., **Shen, Y.**, Gao, S., Liu, Y., Richardson, A. 2023, A reference dataset of land surface phenology from fused Harmonized Landsat 8/Sentinel-2 with PhenoCam data. *Scientific Data* (link).
14. **Shen, Y.**, Zhang, X.*, Yang Z., Ye Y., Wang J., Gao S., Liu Y., Wang, W., Tran H. K., Ju J., 2023, Developing an operational algorithm for near-real-time monitoring of crop progress at field scales by fusing harmonized Landsat and Sentinel-2 time series with geostationary satellite observations, ***Remote Sensing of Environment*** (link).
15. **Shen, Y.**, Zhang, X.*, Yang, Z., 2022, Mapping corn and soybean phenometrics at field scales over the United States Corn Belt by fusing time series of Landsat 8 and Sentinel-2 data with VIIRS data, ***ISPRS Journal of Photogrammetry and Remote Sensing*** (link).

16. Zhang, X.*, **Shen, Y.**, Gao, S., Wang, W., Schaaf, C., 2022, Diverse responses of multiple satellite-derived vegetation greenup onsets to dry periods in the Amazon. ***Geophysical Research Letters*** (link).
17. Tran, K.H., Zhang, X.*, Ketchpaw, A.R., Wang, J., Ye, Y., **Shen, Y.**, 2022, A novel algorithm for the generation of gap-free time series by fusing harmonized Landsat 8 and Sentinel-2 observations with PhenoCam time series for detecting land surface phenology, ***Remote Sensing of Environment*** (link).
18. Ye, Y., Zhang, X.*, **Shen, Y.**, Wang, J., Crimmins, T., Scheifinger, H., 2022, An optimal method for validating satellite-derived land surface phenology using in-situ observations from national phenology networks, ***ISPRS Journal of Photogrammetry and Remote Sensing*** (link).
19. **Shen, Y.**, Zhang, X.*, Wang, W., Nemani, R., Ye, Y., and Wang, J., 2021, Fusing Geostationary Satellite Observations with Harmonized Landsat-8 and Sentinel-2 Time Series for Monitoring Field-Scale Land Surface Phenology, ***Remote Sensing*** (link).

In review/revision

20. Gu, H., Qiu, H., Zhang, X., Wang, F., **Shen, Y.**, Shen, P., Yu. M., Wang, X., Chen, T., Gou, H., Jin, Y., Ma, Y., Zhang, R., Wu, C., Peñuelas, J., Chen, L.*, Reversing effects of seasonal warming on autumn leaf senescence across the Northern Hemisphere, (under review)
21. An, S., Zhang, X.*, Henebry, G., Ye, Y., Liu, Y., Tran, K., **Shen, Y.**, Li, F., 2025, Temperature sensitivity of vegetation greenness rate along aridity gradient flips between arid and humid ecoregions, (under submission)
22. Yang, Y.†, **Shen, Y.**†, Tan, H.†, Yang, H., Ye, Y., Liao, Z., Wu, C., Peñuelas, J., Ciais, P., Qiu, T., Chen, L.*, 2025, Asymmetric photosynthetic responses to hydrothermal variations between the two halves of the year in the Amazon rainforest, (under review)
23. Malik, A. N., Zhang, X.*, **Shen, Y.**, Yang, Z., Ye, Y., Liu, Y., 2025, Towards Operationally Tracking Weekly Crop Progress using VIIRS Land Surface Phenology Product Across the Continental United States, *ISPRS Journal of Photogrammetry and Remote Sensing*, (under review)
24. Cen, Y.*, Hou L.*, and Gao, X., Liu K., Li, Y., **Shen, Y.**, Yang, Y., Wang, Z., Wang, J., 2025, Temporally Extending Long-Term Forest Productivity Dynamics Using Landsat-Derived Vegetation Index and Phenology. *Agricultural and Forest Meteorology*, (under revision)
25. Gao, S., Zhang, X.*, Ye, Y., Liu, Y., An, S., **Shen, Y.**, 2025, Phenological variations in canopy greenness across Amazon evergreen forests observed from GOES-16 ABI. *Agricultural and Forest Meteorology*, (under review)
26. Ye, Y., Zhang, X.*, **Shen, Y.**, Tran, H. K., Gao, S., Liu, Y., An, S., Improvement of the consistency among long term global land surface phenology products derived from AVHRR, MODIS, and VIIRS Observations. *ISPRS Journal of Photogrammetry and Remote Sensing*, (under revision)

CONFERENCE PRESENTATIONS

Selected oral Presentations

1. **Shen, Y**., Zhang, X., Gao, S., Zhang, H. K., Schaaf C., Wang W., Ye Y., Liu Y., Tran H. K., Investigation of GOES-R ABI EVI2 time series adjusted using different BRDF models. *AGU Fall Meeting 2023*, Dec. 11-15, San Fransico, CA, USA.
2. **Shen, Y.**, Zhang, X., Yang, Z., Gao, S., Ye, Y., Liu, Y., Wang, W., Monitoring Crop Progress at Field Scales in Near-real-time by Fusing Harmonized Landsat and Sentinel-2 Time Series with Geostationary Satellite Observations. *AAG-GPRM Annual Meeting 2023*, Oct. 6-7, Sioux Falls, SD, USA.
3. **Shen, Y.**, Zhang, X., An Operational Algorithm for Monitoring Near-real-time Crop Progress at Field Scales by Fusing Harmonized Landsat and Sentinel-2 Time Series with Geostationary Satellite Observations. *53rd South Dakota State Geography Convention 2023*, Brooking, SD, USA.

4. **Shen. Y.**, Zhang, X., Estimating Various Corn and Soybean Phenometrics at Field Scales by Fusing Time Series of VIIRS and HLS Data Over the US Corn Belt. *52nd South Dakota State Geography Convention 2022*, Brooking, SD, USA.
5. Zhang, X., **Shen, Y.**, Gao, S., Improved Land Surface Phenology Detections from Time Series fused Landsat and Sentinel-2 with Geostationary Satellites, *The 22nd William T. Pecora Memorial Remote Sensing Symposium 2022*, Oct. 24-27, Denver, CO, USA.

Selected poster Presentations

6. **Shen, Y.**, Zhang, X., Near real-time mapping of corn and soybean at 30 m pixels by blending crop phenometrics with growth magnitude from multi-source satellite observations. *AGU Fall Meeting 2024*, Dec. 9-13, Washington, D.C., IL, USA
7. Tran, K., Zhang, X., Ye, Y., **Shen, Y.**, Gao, S., Liu, Y., Richardson, A., Fusion of Harmonized Landsat 8 and Sentinel-2 observations with near-surface PhenoCam time series for generating a benchmark dataset of land surface phenology. *AGU Fall Meeting 2023*, Dec. 11-15, San Fransico, CA, USA
8. **Shen, Y.**, Zhang, X., Yang, Z., Wang, J., Ye, Y., Wang, W., A novel algorithm for near real-time crop Progress Monitoring at Field Scales by fusing observations from harmonized Landsat and Sentinel-2 and geostationary satellites. *AGU Fall Meeting 2022*, Dec. 12-16, Chicago, IL, USA.
9. **Shen, Y.**, Zhang, X., Fusing New Generation Geostationary Satellite Observations with Landsat-8 and Sentinel-2 Time Series for Monitoring Land Surface Phenology, *AGU Fall Meeting 2021*, Dec. 13-17, New Orleans, LA, USA.
10. **Shen, Y.**, Zhang, X., Yang, Z., 2020, Mapping Crop Phenological Metrics at Field Scales by Fusing Time Series of VIIRS and HLS over the United States Corn Belt, *AGU Fall Meeting 2021*, Dec. 10-17, Online.

RELEVANT SKILLS

Computing: Interactive Data Language (IDL), R, C, Linux, Perl, Python, HPC (cluster)

Software: ENVI, ArcGIS, ArcGIS Pro, Google Earth Engine

PROFESSIONAL SERVICES

Journal Referee

Remote Sensing of Environment, Agricultural and Forest Meteorology, IEEE Transactions on Geoscience and Remote Sensing, Journal of Geophysical Research – Biogeosciences, ISPRS Journal of Photogrammetry and Remote Sensing, International journal of applied earth observation and geoinformation, Computers and electronics in agriculture, Geo-spatial Information Science, Remote Sensing, GIScience and Remote Sensing, Agronomy.

Guest Editor

Forests (https://www.mdpi.com/journal/forests/special_issues/ZE1O2R766P)

Teaching/Lab assistant

Guest lecture: Global Fire Seasonality Shifting (Spatial Ecology-ENVIRON 567) 2025-Fall

Guest lecture: Advanced Methods in Geospatial Modeling (GSE/GEOG 760) 2022-2023 Spring

Guest Lecture: Satellite Data Format and Processing (GSE/GEOG 760) 2025 Spring

Mentored students

Peiyu Du, *Ph. D*. Geography and Geospatial Science Department, SDSU 2024-2025

Malik, Naeem Abbas, *Ph. D*. Geography and Geospatial Science Department, SDSU 2023-2025