

Chunyuan Diao

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EDUCATION

- 2017 Ph.D. **Geography, State University of New York at Buffalo**
2014 M.A. **Biostatistics, State University of New York at Buffalo**
2010 B.S. **Resources Science and Engineering, Beijing Normal University**

PROFESSIONAL APPOINTMENTS

- 2017-present **Assistant Professor**, Department of Geography and GIScience, UIUC
2017-present **Founding Director**, Remote Sensing Space-Time Innovation (RSSI) Lab, UIUC
2014-2016 **Research Assistant**, Department of Urban and Regional Planning, State University of New York at Buffalo
2010-2014 **Teaching Assistant**, Department of Geography, State University of New York at Buffalo

RESEARCH INTERESTS

- Time series remote sensing, space-time analytics
- Vegetation phenology, continuous vegetation monitoring
- Computational remote sensing, deep learning
- Agriculture, forest, and invasive species dynamics

HONORS AND AWARDS

- 2021 **NSF CAREER Award**, National Science Foundation.
2021 **NASA Early Career Investigator Award**, National Aeronautics and Space Administration.
2020 **Early Career Scholars in Remote Sensing Award**, Remote Sensing Specialty Group, Annual Meeting of the Association of American Geographers.
2019 **AI for Earth Award**, Microsoft
2018 **Arnold O. Beckman Research Award**, University of Illinois at Urbana-Champaign
2018 **NSF Blue Waters Broadening Participation Allocation Award**, National Center for Supercomputing Applications

- 2018-2019 **Teacher Ranked as Excellent**, Center for Teaching Excellence, University of Illinois at Urbana-Champaign
- 2017 **Robert N. Colwell Memorial Fellowship**, American Society for Photogrammetric Engineering and Remote Sensing (ASPRS).
- 2017 **People's Choice Award of Poster Competition**, University Consortium for Geographic Information Science (UCGIS).
- 2017 **NSF Travel Award**, University Consortium for Geographic Information Science (UCGIS) Symposium and Summer School.
- 2016 **Mark Diamond Research Foundation Grant Award**, State University of New York at Buffalo.
- 2015 **DigitalGlobe Foundation Award for the Application of High-Resolution Digital Satellite Imagery**, American Society for Photogrammetric Engineering and Remote Sensing (ASPRS).
- 2015 **ASPRS Student of the Year Award**, Central New York Region of ASPRS.
- 2015-2017 **Graduate School Conference Travel Grant**, State University of New York at Buffalo.
- 2013 **Student Honors Paper Competition Award**, Remote Sensing Specialty Group, Annual Meeting of the Association of American Geographers.
- 2013 **Retention Award**, State University of New York at Buffalo.
- 2012 **UNESCO Chair Young Scholar Summit Student Paper Award**, UNESCO Chair in Hydroinformatics and Ecohydrology, Capital Normal University, Beijing, China.
- 2010-2014 **Dean's Scholarship**, State University of New York at Buffalo.

PUBLICATIONS (* denotes student advisees)

- **Diao, C.**, Yang, Z.*, Gao, F., Zhang, X., and Z. Yang. (2021). Hybrid phenology matching model for robust crop phenological retrieval. *ISPRS Journal of Photogrammetry and Remote Sensing*, 181, 308-326.
- Yang, Z. *, **Diao, C.** and B. Li. (2021). A robust hybrid deep learning model for spatiotemporal image fusion. *Remote Sensing*, 13(24), 5005.
- Gao, F., Anderson, M.C., Johnson, D.M., Seffrin, R., Wardlow, B.; Suyker, A., **Diao, C.** and D.M. Browning. (2021). Towards routine mapping of crop emergence within the season using the harmonized Landsat and Sentinel-2 dataset. *Remote Sensing*, 13(24), 5074.
- Lv, X., Shao, Z., Ming, D., **Diao, C.**, Zhou, K., and C. Tong. (2021). Improved object-based convolutional neural network (IOCNN) to classify very high-resolution remote sensing images. *International Journal of Remote Sensing*, 42, 8318-8344.
- **Diao, C.** (2020). Remote sensing phenological monitoring framework to characterize corn and soybean physiological growing stages. *Remote Sensing of Environment*, 248, 111960.
- Wang, L., **Diao, C.**, Xian, G., Yin, D., Lu, Y., Zou, S., and T.A. Erickson. (2020). A summary of the special issue on remote sensing of land change science with Google earth engine. *Remote Sensing of*

Environment, 248, 112002.

- Tian, J., Wang, L., Yin, D., Li, X., **Diao, C.**, Gong, H., Shi, C., Menenti, M., Ge, Y., Nie, S., Ou, Y., Song, X. and X. Liu. (2020). Development of spectral-phenological features for deep learning to understand *Spartina alterniflora* invasion. *Remote Sensing of Environment*, 242, 111745.
- **Diao, C.** (2019). Complex network-based time series remote sensing model in monitoring the fall foliage transition date for peak coloration. *Remote Sensing of Environment*, 229, 179-192.
- **Diao, C.** (2019). Innovative pheno-network model in estimating crop phenological stages with satellite time series. *ISPRS Journal of Photogrammetry and Remote Sensing*, 153, 96-109.
- Shao, Z., Pan, Y., **Diao, C.**, and J. Cai. (2019). Cloud detection in remote sensing images based on multiscale features-convolutional neural network. *IEEE Transactions on Geoscience and Remote Sensing*. 1-15.
- Kang, B. and **C. Diao**. (2018). Walking school bus program feasibility in a suburban setting. *Journal of Planning Education and Research*.
- **Diao, C.** and L. Wang. (2018). Landsat time series-based multiyear spectral angle clustering (MSAC) model to monitor the inter-annual leaf senescence of exotic saltcedar. *Remote Sensing of Environment*, 209, 581-593.
- Zhou, L., Wu, J., Mo, X., Zhou, H., **Diao, C.**, Wang, Q., Chen, Y., and F. Zhang. (2017). Quantitative and detailed spatiotemporal patterns of drought in China during 2001-2013. *Science of the Total Environment*, 589, 136-145.
- **Diao, C.** and L. Wang. (2016). Incorporating plant phenological trajectory in exotic saltcedar detection with monthly time series of Landsat imagery. *Remote Sensing of Environment*, 182, 60-71.
- **Diao, C.** and L. Wang. (2016). Temporal partial unmixing of exotic saltcedar using Landsat time series. *Remote Sensing Letters*, 7(5), 466-475.
- Yoo, E.-H., Chen, D., **Diao, C.**, and C. Russell. (2016). The effects of weather and environmental factors on West Nile virus mosquito abundance in Greater Toronto Area. *Earth Interactions*, 20, 1-22.
- Wang, L., Shi, C., **Diao, C.**, Ji, W., and D. Yin. (2016). A survey of methods incorporating spatial information in image classification and spectral unmixing. *International Journal of Remote Sensing*, 37(16), 3870-3910.
- Zhou, W., Shao, Z., **Diao, C.**, and Q. Cheng. (2015). High-resolution remote-sensing imagery retrieval using sparse features by auto-encoder. *Remote Sensing Letters*, 6(10), 775-783.
- Zhang, L., Shao, Z., and **C. Diao**. (2015). Synergistic retrieval model of forest biomass using the integration of optical and microwave remote sensing. *Journal of Applied Remote Sensing*, 9(1), 096069.
- Shao, Z., Zhou, W., Cheng, Q., **Diao, C.**, and L. Zhang. (2015). An effective hyperspectral image retrieval method using integrated spectral and textural features. *Sensor Review*, 35(3), 274-281.
- **Diao, C.** and L. Wang. (2014). Development of an invasive species distribution model with fine-resolution remote sensing. *International Journal of Applied Earth Observation and Geoinformation*, 30, 65-75.
- Wang, L. and **C. Diao**. Automated individual tree-crown delineation and treetop detection with very-high-resolution aerial imagery, in eds. Wang, G. & Weng, Q. *Remote Sensing of Natural Resources*, CRC Press, 2013.

- Wu, J., Zhou, L., Liu, M., Zhang, J., Leng, S., and **C. Diao**. (2013). Establishing and assessing the Integrated Surface Drought Index (ISDI) for agricultural drought monitoring in mid-eastern China. *International Journal of Applied Earth Observation and Geoinformation*, 23, 397-410.
- Zhou, L., Wu, J., Leng, S., Liu, M., Zhang, J., Zhao, L., **Diao, C.**, Zhang, J., Luo, H., Zhang, F., and Y. Shi. (2012). Using a new integrated drought monitoring index to improve drought detection in mid-eastern China. In, *Geoscience and Remote Sensing Symposium (IGARSS), 2012 IEEE International* (pp. 883-886): IEEE.

TEACHING EXPERIENCE

- GEOG 489 – Programming for GIS (UIUC) Spring 2019, Spring 2020
Developed lecture and lab materials for introducing the principles of programming, spatial data structures and algorithms, and programming applications in geospatial science
- GEOG 478 - Techniques of Remote Sensing (UIUC) Spring 2018, Spring 2020
Developed lecture and lab materials for introducing the techniques of digital image interpretation and processing in remote sensing applications
- GEOG 477 - Introduction to Remote Sensing (UIUC) Fall 2017, Spring 2019, Fall 2019, Spring 2021
Developed lecture and lab materials for introducing the principles and applications of remote sensing in a wide range of disciplines
- GEO 411- Multivariate Statistics in Geography (State University of New York at Buffalo) Spring 2014
Designed and taught all class materials for an undergraduate-level lecture course focused on introducing the theoretical concepts and applications of multivariate statistical techniques in geography.

RESEARCH EXPERIENCE

- 2014-2016 Research Assistant (State University of New York at Buffalo). United States Department of Transportation (USDOT) funded project: *Active commuting in the sweet home central school district*.
- 2013 Research Assistant (State University of New York at Buffalo). University Transportation Research Center funded project: *A GIS-based performance measurement system for assessing transportation sustainability and community livability*.
- 2010-2013 Research Assistant (State University of New York at Buffalo). United States Department of Agriculture (USDA) funded project: *Assessment, monitoring and prediction of the spatial invasion of saltcedar in the lower Rio Grande using multi-resolution and multi-temporal remotely sensed imagery*.

CONFERENCE PRESENTATIONS (* denotes student advisees)

- Diao, C.** and Z. Yang*. Retrieval of crop growing progress with remote sensing and phenology-matching models. *Annual Meeting of the Association of American Geographers (AAG)*, Seattle, WA. April 7-April 11, 2021.

Li, G.* and **C. Diao**. Fine-scale crop phenological monitoring with near-surface remote sensing and high-resolution satellite time series. *Annual Meeting of the Association of American Geographers (AAG)*, Seattle, WA. April 7-April 11, 2021.

Yang, Z.* and **C. Diao**. A novel deep learning-based phenology matching model for characterizing crop phenological stages with fused high spatio-temporal resolution imagery. *Annual Meeting of the Association of American Geographers (AAG)*, Seattle, WA. April 7-April 11, 2021.

Zhao, Y.* and **C. Diao**. Monitoring multi-level forest phenology with time series satellite imagery. *Annual Meeting of the Association of American Geographers (AAG)*, Seattle, WA. April 7-April 11, 2021. (Student Honors Paper Competition Award).

Zhang, C.* and **C. Diao**. The hybrid CNN-LSTM model for county-level yield prediction using satellite images. *Annual Meeting of the Association of American Geographers (AAG)*, Seattle, WA. April 7-April 11, 2021.

Diao, C. and Z. Yang*. An innovative phenology-matching model to estimate crop growing stages. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA. December 7-December 11, 2020.

Diao, C. Large-scale operational framework to characterize crop phenological stages with satellite time series. *Annual Meeting of the Association of American Geographers (AAG)*, Denver, CO, April 6-April 10, 2020.

Yang, Z.* and **C. Diao**. A robust hybrid deep learning modeling framework for spatiotemporal image fusion. *Annual Meeting of the Association of American Geographers (AAG)*, Denver, CO, April 6-April 10, 2020. (Student Honors Paper Competition Award).

Li, G.* and **C. Diao**. Fine-scale crop phenological monitoring with near-surface remote sensing and high resolution satellite remote sensing time series. *Annual Meeting of the Association of American Geographers (AAG)*, Denver, CO, April 6-April 10, 2020.

Diao, C. Integrated modeling framework to estimate crop phenological stages with satellite time series. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA. December 9-December 13, 2019.

Diao, C. Continental-scale remote monitoring of invasive species dynamics through petascale high performance computing system. *NSF Blue Waters Symposium for Petascale Science and Beyond*, Sunriver, Oregon. June 3-June 6, 2019.

Diao, C. Innovative pheno-network model in characterizing the phenological process of vegetation. *Annual Meeting of the Association of American Geographers (AAG)*, Washington, D.C. April 3-April 7, 2019.

Li, G.* and **C. Diao**. Near-surface and high resolution satellite remote sensing time series for understanding crop phenological responses to climate change. *Annual Meeting of the Association of American Geographers (AAG)*, Washington, D.C. April 3-April 7, 2019. (Student Illustrated Paper Competition Award).

Diao, C. Monitoring the leaf coloration of fall phenology through innovative models. *American Geophysical Union (AGU) Fall Meeting*, Washington, D.C. December 10-December 14, 2018.

Diao, C. and L. Wang. Phenology-guided composite image for monitoring invasive species using Landsat time series. *Annual Meeting of the Association of American Geographers (AAG)*, New Orleans, LA, April 10-April 14, 2018.

Diao, C. and L. Wang. Incorporating spatiotemporal phenological variation in detecting exotic saltcedar using Landsat time series. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 11-December 15, 2017.

Diao, C. and L. Wang. Monitoring the inter-annual leaf senescence of exotic saltcedar using Landsat time series. *Annual Meeting of the Association of American Geographers (AAG)*, Boston, MA, April 5-April 9, 2017.

Diao, C. and L. Wang. Landsat-based temporal mixture analysis for estimating invasive saltcedar abundance: A phenology-guided approach. *Annual Meeting of the Association of American Geographers (AAG)*, San Francisco, CA, March 29-April 2, 2016.

Raja, S., Leccese, J. and **C. Diao**. Participatory action research to build local government capacity to strengthen food systems. *Enhancing Food Security in the Northeast with Regional Food Systems Conference (EFSNE)*, Greenbelt, MD, December 10, 2015.

Raja, S., Khojasteh, M., Hodgson, K., Clark, J. and **C. Diao**. Over-regulation and under-investment: planners's response to communities' efforts to strengthen food systems. *Annual Conference of the Association of Collegiate Schools of Planning (ACSP)*, Houston, TX, October 22-25, 2015.

Diao, C. and L. Wang. Mapping invasive saltcedar distribution with spectral and phenological measures from multi-seasonal Landsat imagery. *Annual Meeting of the Association of American Geographers (AAG)*, Chicago, IL, April 21-25, 2015.

Diao, C. and L. Wang. Incorporation of spectral and phenological information in invasive saltcedar mapping with multi-temporal Landsat imagery. *Graduate Student Research Symposium*, State University of New York at Buffalo, Buffalo, NY, April 10, 2015.

Diao, C. and L. Wang. Development of an invasive species distribution model with fine-resolution remote sensing. *Annual Meeting of the Association of American Geographers (AAG)*, Los Angeles, CA, April 9-13, 2013. (Student Honors Paper Competition Award).

Diao, C. and L. Wang. Developing a remote sensing-driven species distribution model: A study of invasive saltcedar (*Tamarix* spp.). *Graduate Student Research Symposium*, State University of New York at Buffalo, Buffalo, NY, April 5, 2013.

Diao, C. and L. Wang. Mapping the suitable habitats of saltcedar with Landsat TM imagery. *UNESCO Chair Young Scholar Summit*, Capital Normal University, Beijing, China, July 9, 2012.

Zhou, L., Wu, J., Leng, S., Liu, M., Zhang, J., Zhao, L., **Diao, C.**, Zhang, J., Luo, H., Zhang, F., and Y. Shi. Using a new integrated drought monitoring index to improve drought detection in mid-eastern China. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Munich, Germany, July 22-27, 2012.

Diao, C. and W. Zhao. Integrating GIS and remote sensing to update the new construction land pricing system in Zhejiang, China. *Research Symposium of Natural Resources*, Beijing Normal University, Beijing, China, 2009.

PROFESSIONAL ACTIVITIES AND SERVICE

- 2021-present **Director/Treasurer**, Remote Sensing Specialty Group, Association of American Geographers.
- 2021-present **Communication Coordinator**, Remote Sensing Specialty Group, Association of American Geographers.
- 2021-present **GIScience Program Committee Chair**, Department of Geography and GIScience, UIUC
- 2021-present **Future of IT Committee Member**, School of Earth, Society, and Environment, UIUC
- 2021-2022 **Search Committee Member**, Assistant Professor Position in Environmental GIS and Geospatial Data Science, Department of Geography and GIScience, UIUC
- 2021 **Session Organizer and Chair**, *Time Series Remote Sensing in Characterizing Land Surface Dynamics* (with Zijun Yang), Annual Meeting of the Association of American Geographers (AAG), Seattle, WA. April 7-April 11, 2021.
- 2020-present **Editorial Board**, *Frontiers in Remote Sensing*
- 2020-present **Guest Editor**, *Time Series Remote Sensing for Land Surface Dynamics Monitoring* (with Xiaolin Zhu, Desheng Liu, Eileen Helmer, Li Zhuo, and David Gwenzi), Special Issue in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.
- 2020-present **Guest Editor**, *Advancing Land Surface Phenological Analysis with High Spatial Resolution Imagery* (with Xiaoyang Zhang, Liang Liang and Rasmus Houborg), Special Issue in *Remote Sensing*.
- 2020-2021 **Colloquium Coordinator**, Department of Geography and GIScience, UIUC
- 2020 **Session Organizer and Chair**, *Time Series Remote Sensing in Characterizing Long-term Land Surface Dynamics* (with Xiaoyang Zhang, Jin Chen, and Xiaolin Zhu), Annual Meeting of the Association of American Geographers (AAG), Denver, CO. April 6-April 10, 2020.
- 2019 **Session Organizer and Chair**, *Remote Sensing Time Series Analysis with Moderate Spatial Resolution Imagery* (with George Xian and Xiaoyang Zhang), Annual Meeting of the Association of American Geographers (AAG), Washington, D.C. April 3-April 7, 2019.
- 2019-2020 **Capricious Grading Committee Member**, Department of Geography and GIScience, UIUC
- 2019 **Award Committee Member**, Remote Sensing Specialty Group, Association of American Geographers.
- 2019 **Competition Judge**, Student Honors Paper Competition, Remote Sensing Specialty Group, Annual Meeting of the Association of American Geographers.
- 2018-2021 **Faculty Co-Director**, Remote Sensing Specialty Group, Association of American Geographers.
- 2018-2021 **Grievance Committee Member**, Department of Geography and GIScience, UIUC

- 2018-2021 **Guest Editor**, *Remote Sensing of Land Change Science with Google Earth Engine* (with Le Wang, George Xian, and David Thau), Special Issue in Remote Sensing of Environment.
- 2018-present **Proposal Reviewer**, National Science Foundation
- 2018-present **Proposal Reviewer**, Society of Woman Geographers Pruitt Grant Competition
- 2018 **Competition Judge**, Research Review Poster Competition, School of Earth Society and Environment, UIUC
- 2018 **Session Organizer and Chair**, *Student Illustrated Paper Competition*, Sponsored by Remote Sensing/Geographic Information Science and Systems Specialty Group, Annual Meeting of the Association of American Geographers (AAG), New Orleans, LA, April 10-April 14, 2018.
- 2018 **Session Organizer and Chair**, *Remote Sensing Time Series Analysis with Moderate Spatial Resolution Imagery* (with Zhe Zhu and Chengbin Deng), Annual Meeting of the Association of American Geographers (AAG), New Orleans, LA, April 10-April 14, 2018.
- 2017-2018 **Capricious Grading Committee Member**, Department of Geography and GIScience, UIUC
- 2017-2018 **Student Co-Director**, Remote Sensing Specialty Group, Association of American Geographers.
- 2015 **Proposal Reviewer**, Mark Diamond Research Foundation Grant, State University of New York at Buffalo.
- 2013-present **Journal Reviewer**, Remote Sensing of Environment; ISPRS Journal of Photogrammetry and Remote Sensing; IEEE Transactions on Geoscience and Remote Sensing; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; International Journal of Applied Earth Observation and Geoinformation; Remote Sensing; Science of the Total Environment; Earth Interactions; International Journal of Remote Sensing; Remote Sensing Letters; IEEE Access; Sensor Review

PROFESSIONAL MEMBERSHIPS

Association of American Geographers (AAG)

American Society for Photogrammetry and Remote Sensing (ASPRS)

American Geophysical Union (AGU)

International Association of Chinese Professionals in Geographic Information Sciences (CPGIS)