**Manzhu Yu**

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| Associate Professor, Department of Geography, College of Earth and Mineral Sciences  Director of Geoinformatics and Earth Observation Laboratory (GEOlab)  Associate of Institute for Computational and Data Sciences (ICDS) Affiliate of Social Science Research Institute (SSRI) and Earth and Environmental Systems Institute (EESI)  The Pennsylvania State University, State College, PA 16801 | 204 Walker Building  mqy5198@psu.edu |

**EDUCATION**

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| Aug 2012 – Dec 2017 | Ph.D. in Earth Systems and Geoinformation Science, George Mason University |
| Aug 2008 – Jun 2012 | B.S. in Remote Sensing Science and Technology, Wuhan University |

**PROFESSIONAL APPOINTMENTS**

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| July 2019 – Present | Assistant Professor, Department of Geography, College of Earth and Mineral Sciences, Pennsylvania State University |
| Feb 2018 – Jun 2019 | Postdoc Research Associate, NSF Spatiotemporal Innovation Center, George Mason University |

**PROFESSIONAL SERVICES**

Editorial Experience*Editorial board for International Journal of Digital Earth* (2023–Present)

*Associate Editor for Frontiers in Environmental Science* (2023–Present)

*Topic Editor for Atmosphere* (2021–Present)

*Guest Editor for**Remote Sensing* (2024–Present)

2020-present Penn State Representative, University Consortium for Geographic Information Science (UCGIS)

2020-2022 Program Committee, DeepSpatial (ACM SIGKDD Workshop on Deep Learning for Spatiotemporal Data, Applications, and Systems)

2016-2019 Member, Organizing committee, AAG Spatiotemporal Symposium

**PUBLICATIONS *(\* student advisee)***

***Journal Articles:***

**Yu, M.**, Zhang, S. ***\****, Ning, H., Li, Z., & Zhang, K. (2024). Assessing the 2023 Canadian wildfire smoke impact in Northeastern US: Air quality, exposure and environmental justice. *Science of The Total Environment*, *926*, 171853.

**Yu, M.**, Huang, Q., & Li, Z. (2024). Deep learning for spatiotemporal forecasting in Earth system science: a review. *International Journal of Digital Earth*, *17*(1), 2391952.

Masrur, A.\*, **Yu, M.**, & Taylor, A. (2024). Capturing and interpreting wildfire spread dynamics: attention-based spatiotemporal models using ConvLSTM networks. *Ecological Informatics*, *82*, 102760.

Zhang, S.\*, & **Yu, M**. (2024). Enhanced urban PM2.5 prediction: Applying quadtree division and time-series Transformer with WRF-Chem. *Atmospheric Environment*, 120758.

Yang, S., Huang, Q., & **Yu, M.** (2024). Advancements in Remote Sensing for Active Fire Detection: A Review of Datasets and Methods. *Science of the Total Environment*, *943*, 173273.

Golosov, N., Wang, S., **Yu, M.**, Karle, N. N., Ideki, O., Abdul-Hamid, B., & Blaszczak-Boxe, C. (2024). Socioeconomic and sociodemographic correlations to COVID-19 variability in the United States in 2020. *Frontiers in Public Health*, *12*, 1359192.

Hu, W., Cervone, G., Trusel, L., & **Yu, M.** (2024). Arctic accessibility: recent trend in observed ship tracks and validation of arctic transport accessibility model. *Annals of GIS*, 1-20.

Lu, M., Jin, C., **Yu, M.**, Zhang, Q., Liu, H., Huang, Z., & Dong, T. (2024). MCGLN: A multimodal ConvLSTM-GAN framework for lightning nowcasting utilizing multi-source spatiotemporal data. *Atmospheric Research*, *297*, 107093.

Lu, M., Zhang, J., **Yu, M.**, Liu, H., He, C., Dong, T., & Mao, Y. (2024). ER-MACG: An Extreme Precipitation Forecasting Model Integrating Self-Attention Based on FY4A Satellite Data. *Remote Sensing*, *16*(20), 3911.

Wu, M., Huang, Q., Sui, T., Peng, B., & **Yu, M.** (2024). A Remote Sensing Spectral Index Guided Bitemporal Residual Attention Network for Wildfire Burn Severity Mapping. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Guo, C., Ge, E., **Yu, M.**, Li, C., Lao, X., Li, S., ... & Zhang, K. (2024). Impact of heat on emergency hospital admissions related to kidney diseases in Texas: Uncovering racial disparities. *Science of The Total Environment*, *909*, 168377.

**Yu, M.**, Masrur, A. ***\****, & Blaszczak-Boxe, C. (2023a). Predicting hourly PM2. 5 concentrations in wildfire-prone areas using a SpatioTemporal Transformer model. *Science of The Total Environment*, *860*, 160446.

**Yu, M.**, Zhang, S. ***\****, Zhang, K., Yin, J., Varela, M., & Miao, J. (2023b). Developing high-resolution PM2. 5 exposure models by integrating low-cost sensors, automated machine learning, and big human mobility data. *Frontiers in Environmental Science*, *11*, 1223160.

Lu, M., Li, Y., **Yu, M.**, Zhang, Q., Zhang, Y., Liu, B., & Wang, M. (2023). Spatiotemporal Prediction of Radar Echoes Based on ConvLSTM and Multisource Data. *Remote Sensing*, *15*(5), 1279.

Blaszczak-Boxe, C. S., Karle, N. N., Wang, S., **Yu, M.**, Golosov, N., Riyad, M., ... & Sen, P. (2023). Environmental Assessment and Monitoring of Heavy Metals in New York City Potable Water Systems: Case Study at Medgar Evers College, Correlation Analysis, and Public Health Impacts. *Water*, *15*(24), 4233.

Masrur, A.\*, **Yu, M.**, Mitra, P., Peuquet, D., & Taylor, A. (2022). Interpretable machine learning for analysing heterogeneous drivers of geographic events in space-time. *International Journal of Geographical Information Science*, *36*(4), 692–719.

Yang, J.\*, **Yu, M.**, Liu, Q., Li, Y., Duffy, D. Q., & Yang, C. (2022). A high spatiotemporal resolution framework for urban temperature prediction using IoT data. *Computers & Geosciences*, *159*, 104991.

Luo, W., Liu, Z., Zhou, Y., Zhao, Y., Li, Y. E., Masrur, A., **Yu, M.**, & others. (2022). Investigating linkages between spatiotemporal patterns of the COVID-19 Delta variant and public health interventions in Southeast Asia: Prospective space-time scan statistical analysis method. *JMIR Public Health and Surveillance*, *8*(8), e35840.

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Lu, M., Zhang, Y., Chen, M., **Yu, M.**, & Wang, M. (2022). Monitoring Lightning Location Based on Deep Learning Combined with Multisource Spatial Data. *Remote Sensing*, *14*(9), 2200.

Di, Y., Lu, M., Chen, M., Chen, Z., Ma, Z., & **Yu, M.** (2022). A quantitative method for the similarity assessment of typhoon tracks. *Natural Hazards*, 1-16.

**Yu, M.**, & Liu, Q. (2021). Deep learning-based downscaling of tropospheric nitrogen dioxide using ground-level and satellite observations. *Science of the Total Environment*, *773*, 145145.

**Yu, M.**, Xu, F., Hu, W., Sun, J., & Cervone, G. (2021). Using Long Short-Term Memory (LSTM) and Internet of Things (IoT) for Localized Surface Temperature Forecasting in an Urban Environment. *IEEE Access*, *9*.

Scheele, C., **Yu, M.** (corresponding author), & Huang Q. (2021). Geographic context-aware text mining: enhance social media message classification for situational awareness by integrating spatial and temporal features, *International Journal of Digital Earth*, DOI: 10.1080/17538947.2021.1968048.

Lu, M., Lao, T., **Yu, M.**, Zhang, Y., Zheng, J., & Li, Y. (2021). PM2. 5 Concentration Forecasting over the Central Area of the Yangtze River Delta Based on Deep Learning Considering the Spatial Diffusion Process. *Remote Sensing*, *13*(23), 4834.

Lu, M., Zhang, Y., Chen, M., **Yu, M.,** Ma, Z., Zheng, J., & Wang, M. (2021). Lightning Strike Location Identification Based on 3D Weather Radar Data. *Frontiers in Environmental Science*, 329.

Liu, Q., Harris, J. T., Chiu, L. S., Sun, D., Houser, P. R., **Yu, M.**, Duffy, D. Q., Little, M. M., & Yang, C. (2021). Spatiotemporal impacts of COVID-19 on air pollution in California, USA. *Science of the Total Environment*, *750*, 141592.

Zhan, Z., Zheng, L., Wei, M., **Yu, M.**, & Jian, W. (2021). Aerial Image Color Balancing Based on Rank-Deficient Free Network. *IEEE Access*, *11*, 18838-18854.

**Yu, M.**, Bambacus, M., Cervone, G., Clarke, K., Duffy, D., Huang, Q., Li, J., Li, W., Li, Z., Liu, Q., & others. (2020). Spatiotemporal event detection: A review. *International Journal of Digital Earth*, 1–27.

**Yu, M.** (2020). A Graph-Based Spatiotemporal Data Framework for 4D Natural Phenomena Representation and Quantification–An Example of Dust Events. ISPRS International Journal of Geo-Information, 9(2), 127.

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Li, Y., Jiang, Y., Yang, C., **Yu, M.**, Kamal, L., Armstrong, E. M., Huang, T., Moroni, D., & McGibbney, L. J. (2020). Improving search ranking of geospatial data based on deep learning using user behavior data. *Computers & Geosciences*, *142*, 104520.

Li, Y., **Yu, M.**, Xu, M., Yang, J., Sha, D., Liu, Q., & Yang, C. (2020). Big data and cloud computing. *Manual of digital earth*, 325-355.

**Yu, M.**, Huang, Q., Qin, H., Scheele, C., & Yang, C. (2019). Deep learning for real-time social media text classification for situation awareness–using Hurricanes Sandy, Harvey, and Irma as case studies. *International Journal of Digital Earth*, 1-18.

**Yu, M.**, Yang, C., & Jin, B. (2018). A framework for natural phenomena movement tracking–Using 4D dust simulation as an example. *Computers & geosciences*, *121*, 53-66.

**Yu, M.**, Yang, C., & Li, Y. (2018). Big data in natural disaster management: a review. *Geosciences*, *8*(5), 165.

**Yu, M.**, & Yang, C. (2017). A 3D multi-threshold, region-growing algorithm for identifying dust storm features from model simulations. *International Journal of Geographical Information Science*, *31*(5), 939-961.

**Yu, M.**, & Yang, C. (2016). Improving the non-hydrostatic numerical dust model by integrating soil moisture and greenness vegetation fraction data with different spatiotemporal resolutions. *Plos one*, *11*(12), e0165616.

***Book Chapter:***

Masrur, A.\*, & **Yu, M.** (2023). Spatiotemporal attention ConvLSTM networks for predicting and physically interpreting wildfire spread. In *Artificial intelligence in earth science* (pp. 119-156). Elsevier.

**Yu, M.**, Shen, T., & Cervone, G. (2022). A comparative study of deep learning-based time-series forecasting techniques for fine-scale urban extreme heat prediction using Internet of Things observations. In *Nanotechnology-Based Smart Remote Sensing Networks for Disaster Prevention* (pp. 253-271). Elsevier.

**Yu, M.**, & Sun, M. (2018). Geospatial Data Discovery, Management, and Analysis at National Aeronautics and Space Administration (NASA). In *Federal Data Science* (pp. 177-191). Academic Press.

Yang, C., Sun, M., Liu, K., Huang, Q., Li, Z., Gui, Z., Jiang, Y., Xia, J., **Yu, M.**, Xu, C., Lostritto, P., & Zhou, N. (2015). Contemporary Computing Technologies for Processing Big Spatiotemporal Data. In M.-P. Kwan, D. Richardson, D. Wang, & C. Zhou (Eds.), *Space-Time Integration in Geography and GIScience: Research Frontiers in the US and China* (pp. 327–351). Springer Netherlands.

Huang, Q., Xia, J., **Yu, M.**, Benedict, K., & Bambacus, M. (2013). Cloud-enabling dust storm forecasting. In *Spatial Cloud Computing: A Practical Approach* (pp. 161-176). CRC Press.

**Yu, M.**, Fu, P., Zhou, N., & Xia, J. (2013). ArcGIS in the cloud. In *Spatial cloud computing: A practical approach* (pp. 111-124). CRC Press.

Huang, Q., Xia, J., **Yu, M.**, Benedict, K., & Bambacus, M. (2013). Cloud-enabling dust storm forecasting. In *Spatial Cloud Computing: A Practical Approach* (pp. 161–176). CRC Press.