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## RESEARCH INTERESTS

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- CyberInfrastructure & HPC
- CyberGIS & GIScience
- Health Geography
- Network Science
- Spatial Analysis & Statistics
- Transportation Geography

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## EDUCATION

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- Ph.D.      University of Illinois Urbana-Champaign, Urbana, IL. 2025 (expected)  
Informatics, Spatial concentration **Advisor:** Dr. Shaowen Wang
- M.S.      University of Illinois Urbana-Champaign, Urbana, IL. 2024 (expected)  
Geography and Geographic Information Science
- B.S.      Westminster College, New Wilmington, PA. 2019  
Mathematics and Financial Economics

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## PUBLICATIONS

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### JOURNAL ARTICLES

- [1] J. Park, **A. Michels**, F. Lyu, S. Y. Han, and S. Wang. “Daily Changes in Spatial Accessibility to ICU Beds and Their Relationship with the Case-Fatality Ratio of COVID-19 in the State of Texas, USA”. In: *Applied Geography* (Mar. 2023). ISSN: 0143-6228. DOI: <https://doi.org/10.1016/j.apgeog.2023.102929>.
- [2] J.-Y. Kang, B. F. Farkhad, M.-p. S. Chan, **A. Michels**, D. Albarracin, and S. Wang. “Spatial Accessibility to HIV Testing, Treatment, and Prevention Services in Illinois and Chicago, USA”. In: *PLOS ONE* 17.7 (July 2022), e0270404. ISSN: 1932-6203. DOI: <https://doi.org/10.1371/journal.pone.0270404>.
- [3] **A. Michels**, J.-Y. Kang, and S. Wang. “Particle Swarm Optimization for Calibration in Spatially Explicit Agent-Based Modeling”. In: *Journal of Artificial Societies and Social Simulation* 25.2 (Mar. 2022), p. 8. URL: <https://doi.org/10.18564/jasss.4796>.
- [4] J.-Y. Kang, **A. Michels**, A. Crooks, J. Aldstadt, and S. Wang. “An integrated framework of global sensitivity analysis and calibration for spatially explicit agent-based models”. In: *Transactions in GIS* 26.1 (Sept. 2021), pp. 100–128. URL: <https://doi.org/10.1111/tgis.12837>.

- [5] J.-Y. Kang, **A. Michels**, F. Lyu, S. Wang, N. Agbodo, V. L. Freeman, and S. Wang. “Rapidly Measuring Spatial Accessibility of COVID-19 Healthcare Resources: A Case Study of Illinois, USA”. In: *International Journal of Health Geographics* (2020). URL: <https://doi.org/10.1186/s12942-020-00229-x>.

## PEER-REVIEWED CONFERENCE PAPERS

- [6] **Michels, A.**, J. Park, B. Li, J.-Y. Kang, and S. Wang. “Impacts of Catchments Derived from Fine-Grained Mobility Data on Spatial Accessibility”. In: *12th International Conference on Geographic Information Science (GIScience 2023)*. Ed. by R. Beecham, J. A. Long, D. Smith, Q. Zhao, and S. Wise. Vol. 277. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Sept. 2023, 52:1–52:6. URL: <https://drops.dagstuhl.de/opus/volltexte/2023/18947>.
- [7] F. Baig, **A. Michels**, Z. Xiao, S. Y. Han, A. Padmanabhan, Z. Li, and S. Wang. “CyberGIS-Cloud: A Unified Middleware Framework for Cloud-Based Geospatial Research and Education”. In: *Practice and Experience in Advanced Research Computing*. PEARC ’22. Boston, MA, USA: Association for Computing Machinery, 2022. ISBN: 9781450391610. DOI: 10.1145/3491418.3535148. URL: <https://doi.org/10.1145/3491418.3535148>.
- [8] **Michels, A.**, J.-Y. Kang, and S. Wang. “An Exploration of the Effect of Buyer Preference and Market Composition on the Rent Gradient Using the ALMA Framework”. In: *Proceedings of the 3rd ACM SIGSPATIAL International Workshop on GeoSpatial Simulation*. GeoSim ’20. Seattle, Washington: ACM, 2020, pp. 48–51. ISBN: 9781450381611. URL: <https://doi.org/10.1145/3423335.3428167>.
- [9] J.-Y. Kang, J. Aldstadt, **A. Michels**, R. Vandewalle, and S. Wang. “CyberGIS-Jupyter for Spatially Explicit Agent-based Modeling: A Case Study on Influenza Transmission”. In: *GeoSim ’19: Proceedings of the 2nd ACM SIGSPATIAL International Workshop on GeoSpatial Simulation*. Chicago, Illinois: ACM, 2019, pp. 32–35. URL: <https://doi.org/10.1145/3356470.3365531>.

## PEER-REVIEWED CONFERENCE EXTENDED ABSTRACTS

- [10] Z. Li, **A. Michels**, A. Padmanabhan, A. Nassar, D. G. Tarboton, and S. Wang. “CyberGIS-Jupyter for Water - An Open Geospatial Computing Platform for Collaborative Water Research”. In: *AGU Fall Meeting Abstracts*. Vol. 2022. Dec. 2022. URL: <https://ui.adsabs.harvard.edu/abs/2022AGUFMIN32A..05L>.
- [11] A. Padmanabhan, Z. Xiao, R. Vandewalle, F. Baig, **A. Michels**, Z. Li, and S. Wang. “CyberGIS-Compute for Enabling Computationally Intensive Geospatial Research”. In: *SpatialAPI’21: Proceedings of the 3rd ACM SIGSPATIAL International Workshop on APIs and Libraries for Geospatial Data Science*. Nov. 2021. DOI: <https://doi.org/10.1145/3486189.3490017>.

- [12] **Michels, A.**, A. Padmanabhan, Z. Li, and S. Wang. “Towards Reproducible Research on CyberGISX with Lmod and Easybuild”. In: *Gateways 2021*. Oct. 2021. URL: <https://doi.org/10.5281/zenodo.5569659>.
- [13] A. Padmanabhan, Z. Xiao, R. Vandewalle, **A. Michels**, and S. Wang. “Enabling Computationally Intensive Geospatial Research on CyberGIS-Jupyter with CyberGIS-Compute”. In: *Gateways 2021*. Zenodo, Oct. 2021. URL: <https://doi.org/10.5281/zenodo.5570056>.

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## RESEARCH GRANTS

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- 2023            PI (Co-PI: Dr. Shaowen Wang), 400,000 credits  
                  Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support (ACCESS)  
                  ACCESS Explore Allocation for “SPACTS: a spatial partitioning algorithm for computing travel-time zones at scale” (CIS230031)

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## AWARDS

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- 2023            Teacher Ranked as Excellent By Their Students, Center for Innovation in Teaching & Learning
- 2023            Student of the Year 2022, CyberGIS Center
- 2022            SESYNC Graduate Research Fellow, National Socio-Environmental Synthesis Center (SESYNC)
- 2020            Third Place, UIUC GIS Day Virtual Student Poster Competition, UIUC Department of Geography & Geographic Information Systems
- 2020            Computational Research Techniques Fellowship, Texas Advanced Computing Center (TACC)
- 2020            First Place, Robert Raskin Student Competition, Cyberinfrastructure Group, American Association of Geographers (AAG)
- 2019            UCGIS Prize for Advances in Geospatial Problem Solving, American Association of Geographers (AAG) / University Consortium for Geographic Information Science (UCGIS)

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## SELECTED PRESENTATIONS

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### INVITED TALKS

- 2022 “CyberGIS-Compute: Geospatial Middleware for Simplifying Access to High-Performance Computing” with Dr. Furqan Baig. *Accelerating Computing for Emerging Sciences (ACES) Workshop 2023*. League City, TX. July 15, 2023.
- 2022 “CyberGIS-Compute: Enabling Simplified Access to High Performance Computing for your Geospatial Computation” with Dr. Anand Padmanabhan. *NSF Institute for Geospatial Understanding through an Integrative Discovery Environment (I-GUIDE) - Virtual Consulting Office*. Virtual. Nov. 2, 2022.
- 2022 “CyberGIS-Compute: Geospatial Middleware for Simplifying Access to High-Performance Computing” with Dr. Anand Padmanabhan. *NSF Institute for Geospatial Understanding through an Integrative Discovery Environment (I-GUIDE) - Virtual Consulting Office*. Virtual. July 27, 2022.

### CONFERENCE TALKS

- 2023 “Impacts of Catchments Derived from Fine-Grained Mobility Data on Spatial Accessibility”. *International Conference on Geographic Information Science (GIScience)*, Leeds, UK, Sept 13, 2023
- 2023 “Exploring Road Infrastructure Inequities Across the Conterminous U.S.”. *American Association of Geographers (AAG) Annual Meeting*, Denver, CO, March 25, 2023
- 2022 “SCAMEL: Spatial Accessibility Analysis at Scale”. *American Association of Geographers (AAG) Annual Meeting*, Virtual, February 28, 2022
- 2021 “Towards Reproducible Research on CyberGISX with Lmod and Easybuild”. *Gateways*, Virtual. Oct 21, 2022
- 2020 “An Exploration of the Effect of Buyer Preference and Market Composition on the Rent Gradient using the ALMA Framework”. *3rd ACM SIGSPATIAL International Workshop on GeoSpatial Simulation*, Virtual. November 3, 2020
- 2020 “Particle Swarm Optimization for Calibration in Spatially Explicit ABMs”. *American Association of Geographers (AAG) Annual Meeting*, Virtual. April 10, 2020

### POSTER PRESENTATIONS

- 2021 “ScalableAccess: Travel-Time Polygons for Accessibility at Scale”. *UIUC GIS Day*, Champaign, IL. November 17, 2021

- 2021 “Rapidly Measuring Spatial Accessibility of COVID-19 Healthcare Resources: A Case Study of Illinois, USA”. *UIUC SESE Research Review*, Champaign, IL. April 23, 2021
- 2020 “Effect of Buyer Preference and Market Composition on the Rent Gradient”. *UIUC GIS Day*, Champaign, IL. November 18, 2020
- 2020 “Particle Swarm Optimization for Calibration in Spatially Explicit ABMs”. *UIUC SESE Research Review*, Champaign, IL. February 14, 2020
- 2019 “CyberGIS-Jupyter for Spatially Explicit Agent-based Modeling”. *UIUC GIS Day*, Champaign, IL. November 13, 2020
- 2018 “Computational Fact-Checking through Knowledge Graphs”. *Undergraduate Research Poster Session at 2019 Joint Mathematics Meeting*, Baltimore, MD. January 19, 2019

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## RESEARCH EXPERIENCE

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- 2019-Present **Research Assistant**  
CyberGIS Center & Geospatial Information Laboratory (CIGI)
- 2020 - 2022 **SESYNC Graduate Research Fellow**  
National Socio-Environmental Synthesis Center (SESYNC)
- 2018 **Informatics Researcher**  
Institute for Pure and Applied Mathematics at UCLA / Praedicat, Inc.

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## INDUSTRY EXPERIENCE

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- 2018 - 2019 **Systems Administrator and Software Engineer**  
Titan Radio and WCN 24/7, New Wilmington, PA
- 2018 **Data Scientist**  
Treloar & Heisel, New Castle, PA
- 2018 **Data Scientist**  
Institute for Pure and Applied Mathematics at UCLA / Praedicat, Inc., Los Angeles, CA

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## TEACHING AND MENTORING

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### Courses Taught as Instructor of Record

- Spring 2023 **Business Location Decisions (GGIS/BADM 205)**  
Department of Geography and Geographic Information Science, UIUC  
List of Teachers Ranked as Excellent By Their Students

## Research Mentor

University of Illinois Urbana-Champaign/CyberGIS Center

Champaign, IL  
*Jan 2020 - Present*

- Supervised six undergraduate research assistants for the CyberGIS Center/I-GUIDE.
- Conducted job searches and interviews to select candidates.

## Teaching Assistant and Tutor

Westminster College

New Wilmington, PA  
*Aug 2015 - Dec 2018*

- Assisted professors in grading and working with students individually for classes covering coursework in Math, Computer Science, and Operations Research.

## Math Tutor

Independent Contractor

New Wilmington, PA  
*Aug 2016 - May 2018*

- Worked with middle and high-school aged students to expand their Math skills.

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## PROFESSIONAL ASSOCIATIONS

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### American Association of Geographers (AAG)

Specialty Groups:

- Applied Geography
- Health and Medical Geography
- Cyberinfrastructure
- Spatial Analysis and Modeling
- GIScience & GIS
- Transportation Geography

### Association for Computing Machinery (ACM)

Special Interest Groups:

- SIGSPATIAL (Spatial Information)

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## SERVICE

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## CONFERENCES AND WORKSHOPS

- |      |   |
|------|---|
| 2023 | <b>Reviewer</b> , Institute for Geospatial Understanding through an Integrative Discovery Environment (I-GUIDE) Forum   |
| 2022 | <b>Symposium Program Co-Chair</b> , AAG 2023 Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions  |
| 2022 | <b>Session Chair</b> , “Data-intensive and Computational Geography,” AAG 2023 Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions       |
| 2022 | <b>Session Organizer</b> , “Computation and Uncertainty of Spatial Accessibility,” AAG 2022 Symposium on Data-Intensive Geospatial Understanding in the Era of CyberGIS |

## JOURNAL REVIEWER

- Geocarto International, Taylor & Francis

## PROFESSIONAL ORGANIZATIONS

2022-Present    **Director, AAG CyberInfrastructure Specialty Group (CISG)**

2021-2022      **Student Director, AAG CyberInfrastructure Specialty Group**

## DEPARTMENTAL SERVICE

2022            **Program Ambassador, UIUC Informatics Program**  
                  Hosted Q&A sessions for prospective and incoming Informatics students