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## RESEARCH INTERESTS

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

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## EDUCATION

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- Ph.D.      University of Illinois Urbana-Champaign, Urbana, IL. 2024 (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.-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: [10.1371/journal.pone.0270404](https://doi.org/10.1371/journal.pone.0270404).
- [2] **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>.
- [3] 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>.
- [4] 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

- [5] 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>.
- [6] **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>.
- [7] 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. ISBN: 978-1-4503-6956-5. URL: <https://doi.org/10.1145/3356470.3365531>.

## PEER-REVIEWED CONFERENCE EXTENDED ABSTRACTS

- [8] 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>.
- [9] **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>.
- [10] 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      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: 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.
- 2018      “Information Extraction and Aggregation for Business Profiling”. *Institute for Pure and Applied Mathematics*, Los Angeles, CA. August 24, 2018

### CONFERENCE TALKS

- 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
- 2019 “Capturing the Predictive Power of Cortical Learning Algorithms”. *National Conference on Undergraduate Research*, Atlanta, GA. April 12, 2019
- 2019 “Computational Fact-Checking through Knowledge Graphs”. *AMS Contributed Paper Session at 2019 Joint Mathematics Meeting*, Baltimore, MD. January 18, 2019
- 2017 “Repeated Play Games”. *Mathematics Association of America (MAA), Allegheny Mountain Section Meeting*, Pittsburgh, PA. April 7, 2017
- 2017 “Optimizing Throughput, Cost, and Safety in Toll Booth Plazas”. *Pi Mu Epsilon Regional Conference*, Youngstown, OH. April 2017

## 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.

## — INDUSTRY EXPERIENCE —

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

## TEACHING AND MENTORING

## Courses Taught

Spring 2023    **Business Location Decisions (GGIS/BADM 205)**  
Department of Geography and Geographic Information Science, UIUC

Teaching Assistant and Tutor  
Westminster College

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

<b>Research Mentor</b>	Champaign, IL
University of Illinois Urbana-Champaign/CyberGIS Center	<i>Jan 2020 - Present</i>

- Supervised four undergraduate research assistants for the CyberGIS Center.
- Conducted job searches and interviews to select candidates.

## PROFESSIONAL ASSOCIATIONS

American Association of Geographers (AAG)

### Specialty Groups:

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

- 2022      **Symposium Program Co-Chair**, AAG 2023 Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions
- 2022      **Session Chair**, “Data-intensive and Computational Geography,” AAG 2023 Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions
- 2022      **Session Organizer**, “Computation and Uncertainty of Spatial Accessibility,” AAG 2022 Symposium on Data-Intensive Geospatial Understanding in the Era of CyberGIS

### PROFESSIONAL ORGANIZATIONS

- 2022-Present    **Director**, AAG CyberInfrastructure Specialty Group (CISG)
- 2021-2022      **Student Director**, AAG CyberInfrastructure Specialty Group

### DEPARTMENTAL SERVICE

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