Alexander C. Michels

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RESEARCH INTERESTS

– CyberInfrastructure & HPC
– CyberGIS & GIScience
– Health Geography

– Network Science
– Spatial Analysis & Statistics
– Spatial Accessibility

EDUCATION

Ph.D. University of Illinois Urbana-Champaign, Urbana, IL. 2024 (expected)
Informatics, Spatial concentration

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

PUBLICATIONS

JOURNAL ARTICLES

[1] **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 (2022), p. 8. URL: https://doi.org/10.18564/jasss.4796.

[2] 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 (2022), pp. 100–128. URL: https://doi.org/10.1111/tgis.12837.

[3] 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

[4] **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.

[5] 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

[6] **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.

[7] 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.

[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.

AWARDS

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 Specialty Group, American Association of Geographers (AAG)
2019	UCGIS Prize for Advances in Geospatial Problem Solving Ammerican Association of Geographers (AAG) / University Consortium for Geographic Information Science (UCGIS)
2018	Best Robot in Division Prize for Senior Unique Division Trinity Fire Fighting Robot Contest
2018	North America Award for Level 2 Trinity Fire Fighting Robot Contest

2017	Paul E. Brown Memorial Scholarship
	Westminster College Mathematics Department
2017	COMAP International Math Modeling Competition Honorable Mention
	COMAP International Math Modeling Competition

SELECTED PRESENTATIONS

INVITED TALKS

| 2018 | "Information Extraction and Aggregation for Business Profiling". *Institute for Pure and Applied Mathematics*, Los Angles, CA. August 24, 2018 |
| 2018 | "Information Extraction and Aggregation for Business Profiling". *Praedicat, Inc.*, Los Angles, CA. July 31, 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

RESEARCH EXPERIENCE

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   **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 Angles, CA

TEACHING AND MENTORING

Research Mentor Champaign, IL
University of Illinois Urbana-Champaign/CyberGIS Center *Jan 2020 - Present*

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

Teaching Assistant and Tutor New Wilmington, PA
Westminster College *Aug 2015 - Dec 2018*

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

PROFESSIONAL ASSOCIATIONS

American Association of Geographers (AAG)
Specialty Groups:

- Cyberinfrastructure
- Economic Geography
- Socialist and Critical Geography
- Spatial Analysis and Modeling
- Transportation Geography

Association for Computing Machinery (ACM)
Special Interest Groups:

- SIGSPATIAL (Spatial Information)

SERVICE

CONFERENCES AND WORKSHOPS

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