

Alexander C. Michels

✉ michels9@illinois.edu
🌐 alexandermichels.github.io
📄 github.com/alexandermichels

🎓 Education

Ph.D. in Informatics

University of Illinois at Urbana-Champaign

– Pursuing the Spatial Informatics concentration under Dr. Shaowen Wang

📍 Champaign, IL

June 2019-Present

B.S. in Mathematics and Financial Economics

Westminster College

– **Honors Thesis:** “Capturing the Predictive Power of Cortical Learning Algorithms”

– Minor in Computer Science — Graduated Cum Laude — Honors in Computer Science and Math — 3.7 GPA

📍 New Wilmington, PA

August 2015 - May 2019

🔬 Research Experience

CyberGIS and CyberInfrastructure Researcher

CyberGIS Center and CyberInfrastructure & Geospatial Information Laboratory (CIGI)

📍 Champaign, IL

June 2019-Present

- Building cyberinfrastructure using Docker Swarm, Hadoop and Kubernetes clusters. I manage an undergraduate research assistant and maintain the development branch of [CyberGIS-Jupyter](#)
- Programming spatially-explicit models for disease and land-use change

Informatics Researcher

Institute for Pure and Applied Mathematics at UCLA / Praedicat, Inc.

📍 Los Angeles, CA

June 2018 -August 2018

- Worked for Praedicat, Inc. automating information extraction, classification, and aggregation from web data for business profiling of over 52,600 companies and corporate entities.
- Worked for IPAM to develop a novel algorithm for computational fact-checking on knowledge graphs and a self-supervised machine learning algorithm for sentence importance which outperformed TF-IDF.

📖 Papers

Peer-Reviewed Publications

- **Michels, Alexander**, Jeon-Young Kang, and Shaowen Wang (2020). “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, pp. 48–51. DOI: [10.1145/3423335.3428167](https://doi.org/10.1145/3423335.3428167).
- Kang, J.-Y., J. Aldstadt, **A. C. Michels**, R. Vandewalle, and S. Wang (2019). “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*. Ed. by Hamdi Kavak, Joon-Seok Kim, and Sarah Wise, pp. 32–35. DOI: [10.1145/3356470.3365531](https://doi.org/10.1145/3356470.3365531).
- Kang, Jeon-Young, **Michels, Alexander C**, Fangzheng Lyu, Shaohua Wang, Nelson Agbodo, Vincent L Freeman, and Shaowen Wang (2020). “Rapidly Measuring Spatial Accessibility of COVID-19 Healthcare Resources: A Case Study of Illinois, USA”. In: *International Journal of Health Geographics*. DOI: [10.1186/s12942-020-00229-x](https://doi.org/10.1186/s12942-020-00229-x).

Submitted/Under Review

- Kang, Jeon-Young, **A. C. Michels**, Jared Aldstadt, Andrew Crooks, and Shaowen Wang (2020). “An Integrated Framework of Global Sensitivity Analysis and Calibration for Spatially Explicit Agent-Based Models: A Case Study of Influenza Transmission”. In: *Submitted to International Transactions in Geographic Information Science*.

Awards

UIUC GIS Day Virtual Student Poster Competition <i>"Third Place"</i>	November 2020 UIUC Department of Geography & Geographic Information Systems
Cyberinfrastructure Specialty Group Robert Raskin Student Competition <i>"First Place for Research in Geospatial Cyberinfrastructure"</i>	April 2020 American Association of Geographers (AAG)
UCGIS Prize for Advances in Geospatial Problem Solving <i>"Advancing Reproducibility in Geospatial Research at the AAG-UCGIS Summer School 2019"</i>	July 2019 UIUC
Best Robot in Division Prize for Senior Unique Division <i>"Robot in the Division with the lowest Total Final Scores"</i>	April 2018 Trinity Fire Fighting Robot Contest
North America Award for Level 2 <i>"The top North American robot in Level 2"</i>	April 2018 Trinity Fire Fighting Robot Contest
Dr. Thomas R. Nealeigh Mathematics Scholarship <i>"awarded to an outstanding junior or senior mathematics major"</i>	March 2018 Westminster College
COMAP International Mathematical Modeling Competition Honorable Mention <i>"excellent modeling and sensitivity analysis"</i>	January 2017 COMAP International Mathematical Modeling Competition

Fellowships & Grants

Computational Research Techniques Fellowship <i>Awarded funds to attend the TACC Summer Institute on Applied Parallel Programming</i>	June 2020 TACC
Financial Opacity and Challenges to Forest Governance in Indonesia and Malaysia <i>Graduate Pursuit Member</i>	February 2020 National Socio-Environmental Synthesis Center (SESYNC)

Selected Presentations

An Exploration of the Effect of Buyer Preference and Market Composition on the Rent Gradient using the ALMA Framework <i>3rd ACM SIGSPATIAL International Workshop on GeoSpatial Simulation</i>	November 2020 ♥ Seattle, WA, virtual
Particle Swarm Optimization for Calibration in Spatially Explicit ABMs <i>American Association of Geographers</i>	April 2020 ♥ Denver, CO, virtual
Capturing the Predictive Power of Cortical Learning Algorithms <i>National Conference on Undergraduate Research</i>	April 2019 ♥ Atlanta, GA
Computational Fact-Checking through Knowledge Graphs <i>AMS Contributed Paper Session at 2019 Joint Mathematics Meeting</i>	January 2019 ♥ Baltimore, MD
Information Extraction and Aggregation for Business Profiling <i>Invited Talk at Institute for Pure and Applied Mathematics</i>	July 2018 ♥ Los Angeles, CA
Repeated Play Games <i>Mathematics Association of America, Allegheny Mountain Section Meeting</i>	April 2017 ♥ Pittsburgh, PA

Teaching Experience

Teaching Assistant and Tutor <i>Westminster College</i>	♥ New Wilmington, PA August 2015 - December 2018
– Assisted professors in grading, working with students individually, and developing curriculum for classes covering coursework in Calculus, Computer Science, and Operations Research.	

Research Interests

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| – Agent-Based Models | – Economic Geography | – Network Science |
| – Complex Systems | – High-Performance Computing | – Spatial Analysis |

Professional Associations

American Association of Geographers (AAG)

Specialty Groups:

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| – Cyberinfrastructure | – Socialist and Critical Geography | – Transportation Geography |
| – Economic Geography | – Spatial Analysis and Modeling | |