Alexander C. Michels

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🎓 Education

University of Illinois at Urbana-Champaign 📍 Champaign, IL
Ph.D. in Informatics *June 2019-Present*
– Pursuing the Spatial Informatics concentration under Dr. Shaowen Wang

Westminster College 📍 New Wilmington, PA
Bachelor of Science in Mathematics and Financial Economics *August 2015 - May 2019*
– 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

💻 Research Experience

CyberGIS and CyberInfrastructure Researcher 📍 Champaign, IL
CyberGIS Center and CyberInfrastructure & Geospatial Information Laboratory (CIGI) *June 2019-Present*
– Conducting spatial informatics research under Dr. Shaowen Wang.
– On Algorithms and Systems team, building cyberinfrastructure including Hadoop and Kubernetes clusters
– On Spatial Modeling team, programming spatial models and simulations

Informatics Researcher 📍 Los Angeles, CA
Institute for Pure and Applied Mathematics at UCLA / Praedicat, Inc. *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.

Computational Finance Research Assistant 📍 New Wilmington, PA
Dr. Charles Shaffer *January 2017 - May 2018*
– Integrated cryptocurrency trading into Dr. Shaffer's algorithmic currency trading application.

🏛 Teaching Experience

Teaching Assistant and Tutor 📍 New Wilmington, PA
Westminster College *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.

📰 Papers

[1] J.-Y. Kang, J. Aldstadt, **A. C. 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* (H. Kavak, J.-S. Kim, and S. Wise, eds.), (New York, NY, USA), pp. 32–35, ACM, 2019.

[2] **A. C. Michels**, "Capturing the Predictive Power of Cortical Learning Algorithms," May 2019. Bachelor's thesis.

[3] H. Ahuja and **A. C. Michels**, "Computational Fact-Checking through Relational Similarity based Path Mining," Jan 2019. AMS Contributed Paper Session at the 2019 Joint Mathematics Meeting.

[4] H. Ahuja, **A. C. Michels**, and L. Shi, "Information Extraction and Aggregation from Unstructured Web Data for Business Profiling," tech. rep., Institute for Pure and Applied Mathematics and Praedicat, Inc., Los Angeles, California, Aug 2018.

📖 Research Interests

- Agent-Based Models
- Complex Systems
- High-Performance Computing
- Network Science
- Spatial Optimization
- Topological Data Analysis

💻 Selected Presentations

Oral Presentations

Capturing the Predictive Power of Cortical Learning Algorithms *April 2019*
National Conference on Undergraduate Research 📍 Atlanta, GA

Computational Fact-Checking through Knowledge Graphs *January 2019*
AMS Contributed Paper Session at 2019 Joint Mathematics Meeting 📍 Baltimore, MD

Information Extraction and Aggregation for Business Profiling *July 2018*
Invited Talk at Institute for Pure and Applied Mathematics 📍 Los Angeles, CA

Decentralizing the World with Blockchain *April 2018*
Undergraduate Research & Arts Celebration 📍 New Wilmington, PA

Repeated Play Games *April 2017*
MAA, Allegheny Mountain Section Meeting 📍 Pittsburgh, PA

Optimizing Throughput, Cost, and Safety in Toll Booth Plazas *February 2017*
Pi Mu Epsilon Regional Conference 📍 Youngstown, OH

Poster Presentations

CyberGIS-Jupyter for Spatially Explicit Agent-based Modeling *November 2019*
Illinois GIS Day 📍 Champaign, IL

Computational Fact-Checking through Knowledge Graphs *January 2019*
Undergraduate Research Poster Session at 2019 Joint Mathematics Meeting 📍 Baltimore, MD

Agent-Based Simulations for Repeated Play Game Theory *April 2017*
Undergraduate Research & Arts Celebration 📍 New Wilmington, PA

🏅 Awards

Cyberinfrastructure Specialty Group Robert Raskin Student Competition Finalist November 2019
"research in geospatial cyberinfrastructure" American Association of Geographers (AAG)

UCGIS Prize for Advances in Geospatial Problem Solving July 2019
"Advancing Reproducibility in Geospatial Research at the AAG-UCGIS Summer School 2019" UCGIS

Best Robot in Division Prize for Senior Unique Division April 2018
"Robot in the Division with the lowest Total Final Scores" Trinity Fire Fighting Robot Contest

North America Award for Level 2 April 2018
"The top North American robot in Level 2" Trinity Fire Fighting Robot Contest

Dr. Thomas R. Nealeigh Mathematics Scholarship March 2018
"awarded to an outstanding junior or senior mathematics major" Westminster College

Paul E. Brown Memorial Scholarship March 2017
"given based on merit and academic achievement" Westminster College

Honorable Mention January 2017
"excellent modeling and sensitivity analysis" COMAP International Mathematical Modeling Competition

Mathematics Book Award March 2017
"presented to the sophomore Mathematics major with the highest GPA" Westminster College

👥 Professional Associations

American Association of Geographers
Specialty Groups:

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