Alexander C. Michels
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Mathematician and Computer Scientist
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Education

- **Westminster College** — New Wilmington, PA
  Bachelor of Science in Mathematics and Financial Economics — *August 2015 - May 2019*
  - 3.7 GPA; Minor in Computer Science
  - Honors Thesis in Hierarchical Temporal Memory focused on A.I. and Time Series Analysis
  - Endowment Fund, Honors Program, Financial Analyst Program, Kappa Mu Epsilon, Men's Choir, Omicron Kappa Sigma, Pi Sigma Pi, and Secretary of Robotics Team

Professional Experience

- **Informatics Researcher** — Los Angeles, CA
  Institute for Pure and Applied Mathematics at UCLA / Praedicat, Inc. — *June 2018 -August 2018*
  - Selected to be a part of 2018's Research in Industrial Projects for Students (RIPS) at UCLA.
  - Worked for Praedicat, Inc. automating information extraction, classification, and aggregation from unstructured web data for business profiling of over 52,600 companies and corporate entities.
  - Used big data, deep neural networks, knowledge graphs, parallel programming, RDFs, and many other techniques to provide Praedicat, Inc. with a new tool for automatically finding information.
- **Software Engineer and Systems Administrator** — New Wilmington, PA
  Titan Radio and WCN 24/7 — *May 2018 - Present*
  - Responsible for the hardware and software required to keep the radio and television station operating.
  - Wrote software to automate work and improve user experience including a program to automatically update the weather conditions on air and automatically Tweet Severe Weather Warnings.
- **Web Developer and Teaching Assistant** — New Wilmington, PA
  Westminster College — *August 2015 - Present*
  - Lead recruitment efforts including bringing a Girls Who Code Club to campus and developing a website for marketing and recruiting purposes using React and Ruby on Rails.
  - Assisted professors in grading, working with students individually, and developing curriculum for classes covering coursework in Calculus, Computer Science, and Operations Research.
- **Research Assistant** — New Wilmington, PA
  Dr. Charles Shaffer — *January 2017 - May 2018*
  - Integrated cryptocurrency trading into Dr. Shaffer's algorithmic currency trading application.
  - We explored inefficiencies between exchanges and backtested technical strategies such as Donchian Channels and Bollinger Bands on Bitcoin, Ethereum, and Litecoin.

Research

Using ARIMA Models to Capture the Predictive Power of Hierarchical Temporal Memory
December 2017 - Present

- Ongoing research in computational neuroscience, specifically HTMs modeled after the neocortex.
- Working to find a mathematical analogy to the predictive power of cortical learning algorithms using ARIMA models to better explain the functions of each part of the neocortex.

Computational Fact-Checking through Relational Similarity based Path Mining
July 2018 - Present

- Developed an algorithm in Python and Cython for computational fact-checking on knowledge networks called *RelPredPath* based on network flow, relational similarity, and discriminative path mining
- Presented our work at IPAM, will be presenting at 2019 Joint Mathematics Meeting, and continually optimizing in the hopes of publishing

Conferences and Talks

- **"Computational Fact-Checking through Knowledge Graphs"** January 2019
  AMS Contributed Paper Session at 2019 Joint Mathematics Meeting *Los Angeles, CA*
- **"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*

Awards

- **Best Robot in Division Prize for Senior Unique Division** August 2018
  "Robot in the Division with the lowest Total Final Scores" *Trinity Fire Fighting Robot Contest*
- **North America Award for Level 2** August 2018
  "The top North American robot in Level 2" *Trinity Fire Fighting Robot Contest*
- **Honorable Mention** January 2018
  "excellent modeling and sensitivity analysis" *COMAP Internation Mathematical Modeling Competition*
- **Mathematics Book Award** March 2017
  "presented to the sophomore Mathematics major with the highest GPA" *Westminster College*

Skills

Computer Science: Parallel Programming, Robotics, Software Engineering, System Administration, Virtualization, Web Development

Data Science: A.I., Big Data, Cognitive Computing, Information Extraction, Machine Learning

Finance and Economics: Algorithmic Trading, Corporate Credit Analysis, GAAP, Risk Analysis

Languages: Python (and Cython), Java, C++, Bash, R, HTML, CSS, XML, Ruby (and Ruby on Rails), Javascript (and React), SQL, Visual Basic

Software & Tools: AWS, Google Cloud, NLTK, Numpy, Pandas, scikit-learn, Selenium