Alexander C. Michels
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Mathematician and Developer
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Education

- **Westminster College** — New Wilmington, PA
  Bachelor of Science in Mathematics and Financial Economics — *Aug. 2015 - Present*
  - Minor in Computer Science
  - All-College Honors Program, Kappa Mu Epsilon (Math Honors), Men's Choir, Omicron Kappa Sigma (All-College Honors), Pi Sigma Pi (All-College Honors), and Secretary of Robotics Team
  - Honors Thesis: "An Exploration of the Topological and Logical Properties of Hierarchical Temporal Memory Networks"

Professional Experience

- **Researcher** — Los Angeles, CA
  Institute for Pure and Applied Mathematics at UCLA/Praedicat, Inc. — *June 2018 - August 2018*
  - I was selected to be a part of 2018's Research in Industrial Projects for Students (RIPS) at UCLA.
  - As part of the program, I am working for Praedicat, Inc. developing web crawlers, searching for explanatory variables for short tail risks, analyzing data to look for legacy exposure to risks, and identifying corporate structure to allocate liabilities.
- **Computer Support Specialist and Software Engineer** — New Wilmington, PA
  Titan Radio and WCN 24/7 — *May 2018 - Present*
  - Responsible for the servers, virtual machines, computers, and streams required to keep the radio and television station operating.
  - Wrote software to update the Titan Radio weather conditions and weather forecast while no one was on the air and automatically Tweet Severe Weather Warnings.
- **Financial Analyst** — New Wilmington, PA
  Program with Moody's Investors Service VP Ben Nelson — *December 2017 - Present*
  - My focus was in economic indicators, looking for Granger Causality and correlations in order to attempt to build a reasonable model of PPGs earnings.
  - Our team ultimately came up with a credit rating along with a bond and stock recommendation which we presented to a panel of experts.
- **Software Engineer and Web Developer** — Portland, NY
  Self Employed — *August 2016 - Present*
  - I write applications, software, websites, and web solutions in a variety of languages.
  - My work includes software for autonomous robotics, servers, websites, smart contracts, Android applications, mathematics libraries, and a variety of computational finance software.
- **Fund Assistant Manager** — New Wilmington, PA
  Westminster College Endowment Fund — *January 2016 - Present*
  - I lead a team of students to research investment opportunities and make decisions for $180,000 of Westminsters Endowment Fund.
  - I am responsible for dissecting financial statements, conducting fundamental analysis, and seeking out high potential, undervalued companies.
  - Our equity portfolio has outperformed the S&P 500 while maintaining a beta of one during my time with the fund.
- **Teaching Assistant and Tutor** — New Wilmington, PA
  Westminster College — *August 2015 - Present*
  - Westminster's Division of Cognitive and Quantitative Sciences selected me during my first year to tutor students and serve as a teaching assistant in mathematics and computer science.
  - I 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 2016 - May 2018*
  - I worked with Dr. Shaffer to integrate cryptocurrency trading into his 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 and Projects

Honors Research Fall 2017 - Present
Supervised by a Board of Advisors *Westminster College*

- My proposal was entitled "An Exploration of the Topological and Logical Properties of Hierarchical Temporal Memory Networks" and was accepted by my Honors Board
- I am hoping to improve on Semantic Folding Theory and the encoding and decoding mechanisms of Hierarchical Temporal Memory and will also focus on attempting to use fuzzy logic and soft computing to improve the performance or forecasting ability of HTMs

Trinity Firefighting Contest August 2017 - April 2018
Westminster Robotics Club *Westminster College*

- Built and programmed an autonomous robot to tackle various challenges at the Trinity Firefighting Contest including putting out candles, navigating a maze, and rescuing a baby doll.
- My team won the Best Robot in Division Prize for the Senior, Unique Division and the North America Award for Level 2.

Blockchain Technology Spring 2018
Supervised by Dr. John Bonomo *Westminster College*

- Explored the technical details of blockchain technology including Elliptic Curve Cryptography, Network Flow Analysis, and Data Structure alternatives to a Merkle Chain
- Developed smart contracts and decentralized applications
- Presented my research and decentralized application at Westminster's Undergraduate Research and Arts Festival

Minimum Square Deviance k-Chinese Postman Problem Fall 2017
Supervised by Dr. Natacha Merz *Westminster College*

- I worked on a variation of the k-Chinese Postman Problem called the Minimum Square Deviance k-Chinese Postman Problem with Dr. Natacha Merz, specifically trying to find solutions for lattice graphs like the square grid graph.
- Although we believe we made some headway, we were unable to prove any of our results because of the intractability of the problem.

Optimizing Throughput, Cost, and Safety in Toll Booth Plazas January 2017
COMAP International Mathematical Modeling Competition *Westminster College*

- Lead a team of mathematicians over a single weekend in an international mathematics competition to produce a 20-page research paper and draft a proposal to the New Jersey Turnpike Authority
- Received Honorable Mention for our solution, placing us in the top 13 in the United States
- Presented at 2017 Pi Mu Epsilon Regional Conference

Skills

Languages: Bash, C++, Clojure, CSS, HTML, Java, Javascript, Python, R, Solidity, XML

Computer Science: Data Science, Machine Learning, Robotics, Basic Web Development

Finance and Economics: Corporate Credit Analysis, Econometrics, Risk Analysis