

## Education

- **Westminster College** New Wilmington, PA  
*Bachelor of Science in Mathematics and Financial Economics* August 2015 - Present
  - Minor in Computer Science
  - Honors Thesis entitled “An Exploration of the Topological and Logical Properties of Hierarchical Temporal Memory Networks” focused on A. I., Cognitive Computing, Logic, and Topology
  - All-College Honors Program, Endowment Fund, Kappa Mu Epsilon, Men’s Choir, Omicron Kappa Sigma, Pi Sigma Pi, and Secretary of Robotics Team

## Professional Experience

- **Software Engineer and Systems Administrator** New Wilmington, PA  
*Titan Radio and WCN 24/7* May 2018 - Present
  - Responsible for the networks, servers, virtual machines, computers, and streams required to keep the radio and television station operating.
  - Wrote various software solutions including one to update the Titan Radio *weather conditions and weather forecast while no one was on the air and automatically Tweet Severe Weather Warnings.*
- **Information Technology Intern** New Castle, PA  
*Treloar & Heisel* September 2018 - Present
  - Responsible for data science and automation necessary for building, maintaining, and utilizing databases including data validation, database normalization, and automated report generation.
  - Developed a variety of applications for company use in languages such as Javascript and Visual Basic.
- **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.
- **Financial Analyst** Various  
*Program with Moody’s Investors Service VP Ben Nelson* December 2017 - Present
  - Responsible for data science and providing macroeconomic perspective.
  - Companies we have focused on include PPG and Olin.
  - Presented a credit rating along with bond and stock recommendations to a panel of experts.
- **Teaching Assistant and Tutor** New Wilmington, PA  
*Westminster College* August 2015 - Present
  - Selected during my first year to tutor students and serve as a teaching assistant in mathematics and computer science courses.
  - 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

### An Exploration of the Topological and Logical Properties of Hierarchical Temporal Memory Networks

- Ongoing research in artificial intelligence modeled after the neocortex.
- Working to improve the encoding and decoding mechanisms of Hierarchical Temporal Memory through topology and attempting to use fuzzy logic to improve the performance or forecasting ability.

### Information Extraction and Aggregation from Unstructured Web Data for Business Profiling

- Proposed and implemented an architecture to perform information extraction, classification, and aggregation at scale. My work focused on Natural Language Processing, Classification, and Big Data.
- Produced high quality structured data at scale for business applications, designed a classification scheme that vastly outperforms TF-IDF, and worked with Knowledge Graphs for Computational Fact-Checking.

### Algorithmic Game Theory

- Developed simple machine learning algorithms in Java to play repeated play game such as Chicken and the Colonel Blotto Game.
- Presented my results at Westminster's 2017 Undergraduate Research and Arts Celebration and the Mathematical Association of America's Allegheny Mountain Section 2017 Spring Meeting.

### Optimizing Throughput, Cost, and Safety in Toll Booth Plazas

- Lead a team of mathematicians over a single weekend in COMAP's International Mathematical Modeling Competition to produce a 20-page research paper.
- Received Honorable Mention for our solution, placing us in the top 13 in the United States and presented our results at 2017 Pi Mu Epsilon Regional Conference

## Presentations and Talks

- |   |                           |
|---|---------------------------|
| • "Information Extraction and Aggregation for Business Profiling" | August 2018               |
| <i>Invited Talk at Institute for Pure and Applied Mathematics</i> | <i>Los Angeles, CA</i>    |
| • "Decentralizing the World with Blockchain"                      | April 2018                |
| <i>Undergraduate Research &amp; Arts Celebration</i>              | <i>New Wilmington, PA</i> |
| • "Strategies in Simulated Repeated Play Game Theory"             | April 2017                |
| <i>MAA, Allegheny Mountain Section Meeting</i>                    | <i>Pittsburgh, PA</i>     |
| • "Optimizing Throughput, Cost, and Safety in Toll Booth Plazas"  | February 2017             |
| <i>Pi Mu Epsilon Regional Conference</i>                          | <i>Youngstown, OH</i>     |

## Projects

### Trinity Firefighting Contest

- 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.

## Skills

**Languages:** Python, Java, C++, Bash, R, HTML, CSS, XML, Javascript, Visual Basic, Clojure

**Computer Science:** Artificial Intelligence, Blockchain, Cognitive Computing, Parallel Programming, Robotics, Software Project Management, Systems Administration, Web Development

**Data Science:** Big Data, Information Extraction, Machine Learning,

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