Braeden Bertz

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Education

University of Wisconsin-Madison — GPA: 3.7 Madison, WI

Bachelor of Science in Mathematics, Computer Sciences Sep 2019 - Dec 2023

Relevant Classes: Programming II/III (CS 300, 400), Linear Algebra I/II (Math 431, 540), Combinatorics (Math 475), Numerical Analysis (Math 514), Artificial Intelligence (CS 540), Stochastic Processes (Math 632)

Work Experience

Strategic Execution Intern, Investments Jun 2022 – Aug 2022

Reinsurance Group of America *Chesterfield, MO*

- Designed an internet-scalable asynchronous Job Scheduling and Queuing Service using AWS SQS, DynammoDB, and Java that processes scheduled tasks for the investment department
- Spearheaded data retrieval and organization of SQL investment database, gathering 26GB of unused data and creating jobs to automate this process using the Job Scheduling and Queuing Service
- Automated 37 hrs/yr of investment compliance work using Python, Alteryx, and VBA with only 5 hours of development
- Authored training material on probability, statistics, and programming as implemented in Python to increase new hires on-boarding speed for the derivatives department

Teaching Assistant Aug 2021 – May 2022

University of Wisconsin-Madison *Madison, WI*

- Lead discussion sections focused on problem solving as applied to calculus I and II, achieving a 4.7/5.0 effectiveness rating compared to school average of 3.6

Skills

C++, Java, Python, SQL, AWS, Alteryx, Linux/Unix

Projects

Fractional Dimension Analysis | *Python 3*

- Quantified price volatility without prior assumptions (i.e., homoscedasticity) using the Minkowski–Bouligand box-counting dimension, visualized using seaborn and matplotlib
- Pre-processed data gathered from nasdaq.com, yahoo! Finance, and University of Missouri - Kansas City using excel and pandas to generate time series data for analysis
- Used statistical hypothesis testing to find best-fit distribution and stationarity of data for normal model validation

Chaotic Fractal Zoo | *Java, JavaFX*

- Rendered fractals in 2 and 3 dimensions using affine transformations and the chaos game algorithm
- Efficiently plotted escape-time-fractals with perturbation theory, series approximations, and glitch auto-correction
- Simulated flocking behavior using boids through a fractal 3d landscape rendered using ray marching

Trading Platform | *Java, Jqeury, MySQL, SQL, JavaFX*

- Connected to nasdaqtrader.com through FTP to get list of available NASDAQ stocks with real-time stock chart viewing using data from Yahoo! Finance and implemented statistical test suite: VWAP, Linear Regression, etc.
- Implemented a GUI through JavaFX for login and security, storing hashed user-data in a MySQL database
- Extended the JavaFX XY-Chart and added date-time ticks for dynamic scaling and transparency based off user mouse input, and custom user drawing and plotting
- A rotating set of 30 students at Middleton High School used this software for their Investments Club until it was retired after 3 years and 150 unique users