Michael Sensenbrenner

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Education

Northern Illinois University DeKalb, IL

B.S in Computer Science; Concentration in Computational Software *Grad Date: May 2026 | GPA: 3.91*

Work Experience

Software Engineer Intern January 2024 – Present

NIU Department of Engineering *DeKalb, IL*

- Collaborating with Dr. Ziteng Wang in the Department of Engineering, to develop a website, that leverages computer vision and machine learning models for the diagnosis of autism in children.

Software Engineer August 2023 – January 2024

MJ Software *DeKalb, IL*

- Developed a full stack application using Angular, Typescript, Docker, NodeJS, and Postgres to create a platform for computer science students to learn and practice topics in discrete math, such as graph theory, combinatorics, and network flows.
- Integrated REST API functionality using TypeScript and RxJS observables; Leveraged the fork Join operator to facilitate asynchronous HTTP requests in a concurrent and parallel manner, resulting in a 22% reduction in server load times.
- Enhanced application performance by using GCP infrastructure with Kubernetes orchestration, implementing automated horizontal scaling, resulting in a 40% decrease in infrastructure expenses.

Data Science Research Intern August 2022 – May 2023

NIU Department of Computer Science *DeKalb, IL*

- Collaborated with Professor David Koop from NIU to detect inconsistencies in predicted arrival times for the Chicago Transit Authority by using Pandas and NumPy to query and analyze outliers in train arrival times within a 7,000,000-line data set.
- Utilized GeoPandas to clean data, by calculating the Euclidean distance between track sensors and stop locations. Analyzed train arrival time deviation for consecutive stops, revealing discrepancies in 36% of the CTA's predictions.
- Showcased the project at CURE to raise awareness about inaccurate train location data and identify areas that require improvement for enhancing efficiency in Chicago public transportation. Published research for the VDS Symposium. (Research Paper)

Data Analyst Intern June 2022 - August 2022

Aargus Plastics *Wheeling, IL*

- Worked with HR management using SQL queries to perform financial analysis of the cash flow statement and balance sheet.
- Found problems in balance sheets by rebalancing financial data to resolve inconsistencies in the financial documentation.
- Performed daily profits and losses (P&L) with accuracy and efficiency resulting in a full-time employment offer.

Projects

Stock Trading Simulator | C++, Python, yfinance API | (GitHub Link)

- Engineered a paper trading program capable of executing both buying and selling of stock securities, making extensive use of class inheritance, function overloading, and STL containers. Used Python scripting for the retrieval of real-time stock quotes.
- Implemented benchmark tests using BOOST Chrono to profile performance; during peak market hours the trading simulation clocked in at an average of 0.4 milliseconds per quote retrieval, and 5.36 milliseconds per portfolio refresh.

Stock Market Dashboard | Python, MySQL, Pandas, Matplotlib, yfinance API | (GitHub Link)

- Developed a Python-based CRUD application tailored for stock and options data analysis. Integrated the yfinance API to fetch historical market data, Pandas for sorting data, and Matplotlib for interactive charts with customizable timeframes.
- Designed stress tests using Pandas and Python's Time module, by converting option call queries into Pandas data frames. Achieved the retrieval of 5,000 option contracts per second, maintaining an average response time of 2 seconds for data refresh.

Bond Pricer | C# | (GitHub Link)

- Created a corporate bond pricing algorithm by implementing a Monte Carlo simulator to statistically calculate the price of a bond at the end of maturity.
- Followed TDD principles by leveraging tests to ensure reliability and quality throughout the development phase.

Skills

- **Languages:** C, C++, C#, Python, Web (HTML/CSS/JavaScript/TypeScript), R, SQL
- **Tools/Technologies:** Git, Docker, GCP, MySQL, Angular, React, Node.js, PowerShell, Bash, Linux, Unix