

Michael Capriotti

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Education

Northwestern University - Bachelor's degree in Computer Science & Mathematics

Evanston, IL

- **GPA:** 3.93. **Coursework:** Data Structures and Algorithms, Linear Algebra & Multivariable Calculus

2024 - 2028

Illinois Mathematics and Science Academy (IMSA) - High School Diploma

Aurora, IL

- **GPA:** 3.95. **Coursework:** Differential Equations, Statistics, Calculus-Based Physics I & II

2021 - 2024

Work Experience

Software Development Intern - Hudson Design House

Oswego, IL / Remote

- Designed and developed a full-stack e-commerce platform using Node.js, Express, MongoDB, and Redis, implementing key features such as user authentication, product browsing, shopping cart, coupon system, and checkout with Stripe.
- Implemented a robust authentication and authorization system using JWT with refresh and access tokens, securing user sessions. Designed role-based access control to restrict admin and user permissions, enhancing data security and compliance.
- Built an admin dashboard with real-time sales analytics, product creation, and order management, leveraging efficient API design and data aggregation techniques. Developed a responsive UI using Tailwind CSS and dynamic frontend components.

Dec 2024 - April 2025

Academic Tutor - Amikka Learning

Remote

- Provided one-on-one tutoring in math and physics to high school and college students, explaining complex concepts in a clear, relatable way. Developed personalized lesson plans to cater to each student's learning style, ensuring they grasped foundational principles while also preparing them for advanced topics.
- Guided students through SAT math and physics sections, helping them improve problem-solving techniques and test-taking strategies. Focused on boosting their confidence, improving their time management, and reinforcing critical concepts.

May 2024 - Sept 2024

Projects

QUBO to Max-Cut - Affiliated with Los Alamos National Laboratory [Github](#) [Arxiv](#) [Globe](#)

Remote

- Contributed to a research paper on Quantum Computing.
- Developed a method to solve combinatorial optimization problems (Portfolio Optimization simulated using Geometric Brownian Motion) using the Quantum Approximate Optimization Algorithm (QAOA) and semidefinite programming (SDP) warm-starts.
- Utilized Python and Qiskit, cvxpy, numpy, scipy, matplotlib for optimization, numerical analysis, and visualization.

March 2024 - Dec 2024

Executives with AI - Affiliated with the Kellogg School of Management [Github](#) [Globe](#)

Evanston, IL

- Contributed to two research studies on top executives, presented at IMSA research conferences.
- Conducted quantitative analysis on the educational backgrounds of 100,000 historical executives, created custom name to ethnicity model and name to gender model using Scikit-learn to assess shifts in demographics over time.
- Developed an optical character recognition (OCR)-based data extraction method with Pytesseract to digitize obituary text. Integrated Pypeteer for UI automation, streamlining the process of inputting digitized data into a large language model (LLM), automating the data analysis. Used Pandas for data sorting and manipulation, and utilized Openpyxl to structure Excel files.

Aug 2022 - June 2024

Risk Game Simulation

- Developed a fully functional Risk-inspired game from scratch using Python. Game mechanics exactly simulate gameplay, and visual elements were created with Pygame for an interactive experience (currently working on optimizing performance).
- Used SQLite3 to collect and store game stats and Dash to display these statistics in an interactive dashboard. Also created a random choice bot and a more advanced bot using NEAT (NeuroEvolution of Augmenting Topologies).

Academic Contributions

Executive's Firm Relations and Implications of Exogenous Death (Conference)

2023 [Globe](#)

Frydman C, Capriotti M, Sun D.

Undergraduate University's Prestige on Top Firm Executives (Conference)

2024 [Globe](#)

Frydman C, Capriotti M, Sun D.

QUBO to Max-Cut (Paper Submitted)

2025 [Globe](#)

Bhattacharya B, Capriotti M, Tate R..

Additional Information

Languages: (Proficient) Python, C++ MySQL, HTML/CSS, Racket (Familiar) Javascript, Java

Libraries: Pandas, NumPy, Pytesseract, Matplotlib, Qiskit, Scikit-learn, Openpyxl, Chatterbot, React, Express, Stripe, Tailwind

Technologies: Node.js, MongoDB, Visual Studio Code, Jupyter Notebook, Google Colab, Git, Excel, Wordpress/WooCommerce

Programs: MIT Introduction to Engineering, and Science (MITES), Goldman Sachs Engineering Possibilities Summit

Activities: Institute for Student Business Education, Consultants Advising Student Enterprises, Table Tennis Club,