

William Roche

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EDUCATION

The College Of New Jersey

Ewing, NJ

Pursuing Bachelor of Science

Expected May 2027

Major in Computer Science, Minor in Mathematics

Cumulative GPA: 3.918/4.0

Major GPA: 4.0/4.0

Dean's List 3/3 Semesters

Upsilon Pi Epsilon Honor Society, TCNJ Chapter

Relevant Coursework: Data Structures, Discrete Structures, Computer Architecture, Analysis and Implementation of Algorithms, Operating Systems, Calculus, Mathematical Proof Writing, Advanced Linear Algebra

Programming Languages: C++, C, Java, Python, SQL, Javascript, HTML, CSS, Typescript

Dev Tools: Github, Docker, FastAPI

RESEARCH EXPERIENCE

Quantum Computing

TCNJ

Research Assistant

Jan 2025 – Current

- Fundamental principles of quantum mechanics, quantum computing, and quantum algorithms.
- Essential mathematical concepts, including linear algebra and group theory, to support research.
- Analyzing quantum algorithms to understand their potential applications and computational advantages with a focus on Grover's Algorithm and Shor's Algorithm.

Blockchain & Digital Assets

TCNJ

Research Assistant

Sep 2024 – Current

- Researching distributed ledger technologies, focusing on consensus mechanisms. (Proof-of-Work, Proof-of-Stake, etc.)
- Performing in-depth analysis on security protocols for various blockchain networks.
- Leveraging expertise to assess the scalability potential of in-demand cryptocurrencies.

WORK EXPERIENCE

Social Media Management

Remote

Freelance Management

Jan 2024 – Current

- Built a 5-figure income through an in-depth understanding of social media algorithms.
- Actively working with brands and other creators to scale various accounts and platforms.

Nellie's Place

Waldwick, NJ

Bus Person

Jun 2022 – Aug 2024

- Coordinated with servers and management to seat the restaurant responsibly and safely seat as many guests as possible.
- Assisting servers in clearing tables and resetting for new guests.

PROJECTS

TCNJ Library Application (PWA)

Sep 2023 – May 2024

- Initiated the development of a Progressive Web Application to augment the TCNJ Library mobile application.
- Responsible for Study room, printer, computer finder features, user interface, and maintenance on motion sensors.
- Coordinated with school administration to align project scope with library needs.

Live Stock Tracker (Currently deployed at <https://stocktracker-z7er.onrender.com>)

Dec 2024

- Engineered a real-time stock tracking system using FastAPI and WebSocket protocols to automate market status monitoring.
- Developed a responsive single-page application with dynamic theming, integrating Chart.js for interactive price visualizations and WebSocket-driven live updates without page refreshes.
- Containerized the application using Docker Compose, creating a scalable architecture with separate frontend and backend .

EXTRACURRICULARS

TCNJ ACM

TCNJ

Member

Aug 2023 – Current

- TCNJ chapter of the Association for Computing Machinery.

TCNJ Digit.all

TCNJ

Member

Aug 2023 – Current

- A club that seeks to promote equality and diversity in STEM.