

WILLIAM ROCHE

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EDUCATION

The College of New Jersey

Aug. 2023 - 2027

- Bachelor's of Science, Computer Science Major
- Mathematics Minor
- 3.918 cumulative GPA
- 4.0 Major GPA
- Dean's List (3/3 Semesters)

Pascack Hills High School

Sept. 2019- June 2023

SKILLS

Programming Languages / Development Tools & Frameworks / Mathematical Foundations

- Skilled with C++, C, Java, Python, SQL, Javascript, HTML, CSS, Typescript
- Experience using Github, Docker, FastAPI, Linux
- Knowledge of Linear Algebra, Calculus, Discrete Mathematics, Fundamental Quantum Mechanics

RESEARCH POSITIONS / PERSONAL PROJECTS

Undergraduate Mentored Research: Quantum Computing

Jan 2025 - Current

- Learning fundamental principles of quantum mechanics, quantum computing, and quantum algorithms.
- Studying essential mathematical concepts, including linear algebra and group theory, to support quantum computing research.
- Analyzing quantum algorithms to understand their potential applications and computational advantages.

Undergraduate Mentored Research: Blockchain Technology & Cryptocurrency Analysis

Sept. 2024 - Current

- Conducting research on 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

Live Stock Tracker

Dec. 2024- Current

- Engineered a real-time stock tracking system using FastAPI and WebSocket protocols, implementing custom data processing for multiple timeframe analyses (1D/1W/1M/1Y) and automated 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 services for simplified deployment and maintenance (Currently deployed at <https://stocktracker-z7er.onrender.com>)

TCNJ Library Progressive Web Application Development

Sept. 2023 - May 2024

- Initiated the development of a PWA to augment the TCNJ Library mobile application using Javascript, HTML, Typescript, and CSS
- Responsible for Study room, printer, and computer finder features, appealing user interface, and maintenance on study room motion sensors
- Worked with an SQL database linked to Raspberry Pi motion sensors (Live data)

EMPLOYMENT

Tiktok, Freelance Social Media Work/Personal Brand, Remote

Jan. 2024 -Current

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

Nellie's Place, Bus Person, Waldwick, NJ

June 2022 -Current

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

ACTIVITIES

TCNJ Men's Soccer, Player

Aug. 2023 -May 2024

- Demonstrating teamwork, discipline, and leadership
- Contributed to team success while balancing academic responsibilities

TCNJ DIGIT.all, Member

Aug. 2023 -Current

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

TCNJ ACM, Member

Aug. 2023 -Current

- TCNJ chapter of the Association for Computing Machinery

VOLUNTEERING

Volnerman Training, Youth Soccer Assistant Coach

June 2023 -Aug. 2024

- Twelve-week program
- Coaching youth soccer players and teaching them the basics of the game
- Encouraging good habits and building character on an individual basis and throughout the group