

# Matthew C. Voynovich

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## EDUCATION

### RENSSELAER POLYTECHNIC INSTITUTE

Troy, NY

Dual Major B.S. in Computer Science and B.S. Information Technology & Web Science  
Concentration in AI, Machine Learning, and Data Science

Aug 2023 - Expected May 2026

**Cumulative GPA:** 3.97/4.0; Dean's List 2023-2024; Accelerated to Graduate in 3 years

**Relevant Coursework:** Data Structures, Algorithms, Foundations of Computer Science, Discrete Mathematics, Numerical Techniques in Computing, Intro to Logic Based AI, Computer Organization, Web Science Development, Computational Vision, Intro to AI, Math Foundations of Machine Learning

**Technical Skills:** Advanced in SQL, PHP, JavaScript, Java, HTML/CSS, React, Node.js, Express.js, MongoDB, Python, C, C++ (Data Structures Implementation), Machine Learning Techniques (Convolutional Neural Networks, PyTorch, etc)

**Awards and Leadership:** 3x Dean's Honor List; Head of Events/Coach for Rensselaer Running Club, UPE Honor Society

### ROSLYN HIGH SCHOOL

Roslyn Heights, NY

Weighted GPA: 103.5; 12 AP Classes

Sep 2019 - June 2023

National Honor Society, Science National Honor Society, Cross Country and Track Captain;

## WORK EXPERIENCE

### INVESTIGATIONS OF QUANTUM PHASE ESTIMATION

RPI, NY

Undergraduate Researcher, RPI

Jan 2025 – Present

- Researching applications of Quantum Phase Estimation (QPE) in Quantum Signal Processing. Exploring the mathematical foundations of quantum Fourier transforms, eigenvalue estimation, and phase estimation techniques to enhance signal processing.
- Designing, implementing, and optimizing quantum circuits using Qiskit, leveraging IBM's quantum computing framework to simulate and test QPE-based algorithms and testing said quantum programs on the RPI Quantum Computer.

## PROJECTS

### HOMEFUL

RPI, NY

Developer

Nov 2024 – Dec 2024

- Developed a web application designed to help students compare off-campus housing options around RPI while also evaluating on-campus alternatives. Using Node.js, Express.js, Vue.js, MongoDB, and our own RESTFUL API, the platform provides an intuitive interface for browsing, filtering, and analyzing housing based on factors like price, location, amenities, and leases.

### AUTOMATED REASONING LIGHTUP (AKARI) SOLVER

RPI, NY

Developer

Nov 2024 – Dec 2024

- Solved the popular logic puzzle, Akari, using Z3, a SMT solver, applying automated reasoning techniques to efficiently solve puzzle configurations. Implemented constraint-based algorithms to validate board states against game rules and generate solutions dynamically. Utilized automated reasoning techniques to efficiently solve board states, ensuring logical accuracy.

### FRESH N' CLEAN

RPI, NY

Developer and Project Lead

Aug 2024 – Dec 2024

- Co-developed Fresh n' Clean, an on-demand laundry service platform connecting users with laundromats and independent contractors, similar to Uber. Utilized JavaScript, PHP, and Google Maps API to create an interactive and effective web application. Collaborated in a team using a modified Agile Scrum framework, utilizing tools on GitHub like projects and issues.

### CUSTOM B+ TREE IMPLEMENTATION IN C++

RPI, NY

Developer

Nov 2023 – Dec 2023

- Implemented a custom B+ Tree in C++ with dynamic node splitting, parent-child balancing, and an optimized range query function for efficient key-value indexing and retrieval. Alongside linked leaf traversal, and recursive memory cleanup for structured and optimized data storage.

### REVERSE WORD SEARCH C++

RPI, NY

Developer

Oct 2023 – Nov 2023

- Developed a reverse word search generator that constructs all possible word search grids of a specified size, ensuring inclusion of given words while excluding specified terms. Implemented efficient backtracking and pruning techniques to optimize grid generation using flattened string pointers to store the boards.

## ACTIVITIES

### RENSSELAER RUNNING CLUB

RPI, NY

Head of Events/Coach

Aug 2023 – Present

- Coordinate race and meeting schedules for the running club, ensuring effective event planning and smooth operations.
- Maintain a disciplined daily training regimen to prepare for competitive races, while also coaching club members to help them improve their personal fitness and performance.