Ethan McCartney

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Github: https://github.com/Master-Pr0grammer Website: tinyurl.com/472m3r5f

Education

Rensselaer Polytechnic Institute (Cumulative GPA: 3.6) - *(Expected graduation: Dec. 2025)* **Aug. 2021 - Present**
Troy, NY

- B.S. Computer Science - GPA: 3.84, (Graduated as of May 2025)
- B.S. Mechanical Engineering - GPA: 3.54
- Artificial Intelligence Minor
- Dean's Honor List & Member of National Society of Leadership and Success (NSLS).

Work Experience

Reinforcement Learning in Quantum Computing Research - *(Research Assistant)* **Jan. 2023 - Present**

- Collaborated with a research team in the use of modern reinforcement learning techniques in problems in quantum computing such as the Ising model, by mapping it to the MaxCut problem. The final algorithm achieved scores that outperform the state of the art BLS algorithm.

Systems Engineer Intern, Potdevin Machine - *(Internship)* **May 2023 - Aug. 2023**

- Constructed bill of materials database containing information on raw materials, manufactured parts, routing information, and vendors.
- Programmed a script to automate the migration of legacy files to a format compatible with new database.
- Designed and implemented a new company wide part numbering system.

Physics I & II Tutor - *(Leadership Position)* **Dec. 2022 - May 2023**

- Provided weekly drop-in tutoring sessions with physics I and II students. Reviewed lecture material & homework, covered practice exams, and addressed any academic challenges encountered by students.

Physics I Mentor - *(Leadership Position)* **Aug. 2022 - Dec. 2022**

- Prepared lessons and conducted two weekly classes of 10-15 students each, reviewing Physics I lectures, practice problems, and quizzes; Exercising important communication skills.
- Coordinated meetings with struggling students to help them keep up with academic responsibilities.
- Proctored several practice exams to help students prepare for exams.

Projects

Custom Game Engine from Scratch **Dec. 2023 - Present**

- Developed a lightweight game engine in C++ with OpenGL for rendering and GLM for linear algebra. Implemented core features including 3D model loading, a camera system, basic object manipulation and physics, and a simple lighting engine. Designed for cross-platform support on Mac, Windows, and Linux.

CPU Scheduling Algorithms **Mar. 2024 - Apr. 2024**

- Designed, Implemented, and benchmarked 4 different CPU scheduling algorithms including RR, SJF, SRT, and FCFS

Wordle Server from Scratch **Mar. 2024 - Mar. 2024**

- Designed a multi-threaded TCP server in C, that supports multiple clients playing the game "Wordle" simultaneously.

CPU Architecture Design **Dec. 2023 - Dec. 2023**

- Designed and implemented a simple accumulator based architecture in verilog. Also, with a 32 bit word size, and 1 Gi main memory, hand designed all op-codes and a simple assembly language and implemented a fibonacci program in the designed assembly language.

Robotic Arm Kinematics **Nov. 2023 - Dec. 2023**

- Utilizing PID controllers, programmed forward kinematics, inverse kinematics via inverse jacobian, path following, and computer vision object tracking.

Natural Language Processing AI **Jul. 2023 - Aug. 2023**

- Designed and deployed an auto regressive Natural Language Processing (NLP) neural network in Python utilizing the transformer architecture and supervised learning techniques.

Recursive Cross-Word Puzzle Algorithm **Mar. 2023 - Mar. 2023**

- Engineered a recursive algorithm in C++ to generate all possible crossword puzzles from a user-defined list of included words, excluded words, and puzzle dimensions.
- Leveraging a dynamic blend of depth-first and breadth-first search techniques, along with strategic symmetry utilization, the algorithm achieved remarkable computational efficiency.

Other Skills & Interests

Technical Skills

Siemens NX, Solidworks, Python, C++, C, Java, R, Matlab, OOP, Pytorch, Linux, MacOS, Windows, Microsoft suite

Interests

Learning new things, Hackathons, programming, AI & robotics, running, camping, fishing, soccer