Ethan McCartney

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

Education

Rensselaer Polytechnic Institute (GPA: 3.5) — Aug. 2021 - 2025, *Troy, NY*

- B.S. Computer Science (CS) - (*with a strong foundation in Engineering)*
  - Completed coursework equivalent to 2 years in Mechanical Engineering in addition to 3 years of CS.
- Dean's Honor List & Member of National Society of Leadership and Success (NSLS).

Work Experience

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

- Constructed a bill of materials database containing information on raw materials, manufactured parts, routing information, and vendors.
- Programmed a Python script that expedited the migration of legacy files to a format seamlessly compatible with the new database, speeding up the database construction process by ~ 400%.
- Designed and implemented a new company wide part numbering system.

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

- 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, *Troy, NY*

- 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

Reinforcement Learning in Quantum Computing Research — Jan. 2023 - Present, *Troy, NY*

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

LLM System Integration & Custom Server - *(Personal Project)* — Dec. 2023 - Present, *Troy, NY*

- **Built a Custom Server**: Engineered a robust server to self-host a local Large Language Model (LLM).
- **Full Stack System Design**: Designed and implemented back-end architecture with an API and a user-friendly front-end web application interface after several prototypes and usability testing.
- **Feature Integration**: Seamlessly integrated the LLM with diverse functionalities, including Retrieval-Augmented Generation (RAG), access to local documents, Google Search, calculator capabilities, a limited Python interpreter, and text-to-speech conversion.

Wordle Server from Scratch - *(Personal Project)* — Mar. 2024 - Mar 2024, *Troy, NY*

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

Natural Language Processing AI - *(Personal Project)* — Jul. 2023 - Aug. 2023, *Madison, CT*

- Designed and deployed an auto regressive Natural Language Processing (NLP) AI in Python utilizing state-of-the-art transformer architecture and supervised learning techniques.

Recursive Cross-Word Puzzle Algorithm — Mar. 2023 - Mar. 2023, *Troy, NY*

- 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, outperforming 80% of benchmarked algorithms in speed and performance metrics.

Wordle Solver - *(Personal Project)* — Nov. 2021 - May 2022, *Troy, NY*

- Programmed an algorithm in Python capable of achieving 100% accuracy in solving the "Wordle" puzzle from The New York Times, completely independent of any external information. Code is open source on my github

Other Skills & Interests

Technical Skills

Python, C++, C, Java, R, Matlab, HTML5, CSS, Object Oriented Programming, data structures, Flask, Selenium, NumPy, Pytorch, Shell Scripting, Linux, MacOS, Windows, Siemens NX, Solidworks, Microsoft suite

Interests

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