Henry Mayer

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Education

Carnegie Mellon University — Pittsburgh, PA
Bachelor's of Science, Electrical and Computer Engineering — *2023 - 2026 (Expected)*
Relevant Coursework: Physics for Engineering, Introduction to Computer Engineering, Concepts in Mathematics

Purdue University — West Lafayette, IN
Non-Degree Seeking Student, Computer Science — *Jan. 2022 – Aug. 2023*
Relevant Coursework: Data Structures and Algorithms, Software Engineering, Computer Architecture, C Programming, Discrete Mathematics, Multivariate Calculus; **Dean's List, GPA: 3.9/4.0**

Technical Experience

Algorithms Engineer — January 2023 – Present
BoilerTime — *West Lafayette, IN*
- Developed a custom heuristic to optimize student schedules based on factors like time of day and professor rating
  (a) Researched optimization techniques including neural network, simulated annealing, and genetic algorithms
  (b) Used Java to implement a genetic algorithm with gradient descent to track convergence to a minimum solution
  (c) Implemented a W3C-compliant WebSocket in Java to transmit status updates to the front-end user interface
  (d) Created a priority-queue-based scheduling system to balance resource demand across threads for each client
- Built class data scrapping software; implemented RESTful API routes for user profile and schedule data access
- Organized a team of 6 members across 3 sprints as Scrum master; attained 100% on-time completion of user stories

Co-Founder and Co-President — May 2018 – Present
Mayer Studios — *Global*
- Headed the company's wearable software division; developed 30 user-centric apps for FitbitOS and WearOS devices
  (a) Created SVG libraries for scrolling, rotation, and drawing GUIs and libraries for navigation and health data
  (b) Used PHP and MySQL to implement RESTFul APIs for weather, image data, and inter-user competitions
  (c) Used OAuth2 for Google and Fitbit authentication and JSON APIs from DarkSky, HERE, and Google Maps
- Handeled more than 500 customer inquiries, generated $30,000 in revenue, and gained customers in 99 countries

CS250 (Computer Architecture) Teaching Assistant — May 2023 – Aug 2023
Purdue University Department of Computer Science — *West Lafayette, IN*
- Developed 3 projects and related quizzes on 7400-series combinatorial and sequential circuits used by 600 students
- Coordinated 2 instructional labs; resolved 85% of online inquiries; reinforced concepts such as cache and pipelining

Algorithms Research Intern — May 2023 – Aug 2023
MMH Dream Lab — *West Lafayette, IN*
- Co-Authored paper on intelligent control algorithms for quadrupedal robots [submitted to *Science Robotics*]
- Investigating applications of optimization heuristics in 3D box packing problems for irregularly shaped items
  (a) Implemented an Octree-based approach to contain 3D geometric data with sublinear average access time
  (b) Investigated reinforcement learning and fuzzy clustering to aid decision making within genetic algorithms

Projects

MiniC | *C, x86 Assembly, Lex, YACC* — 2023
- Utilized Lex to tokenize C input files and YACC to implement grammar production rules to transform source code
- Engineered a stack machine architecture to execute mathematical operations; implemented static type checking

Maps Collection | *JavaScript, React, Google Maps, SVG* — 2019 – Present
- Developed wearable apps using Native JavaScript to display maps, attractions, and driving time to a list of places
- Created a mobile companion using React Native and Native JS to fetch map data from HERE and Google Maps

ScienCalc | *C, C++, Git* — 2023
- Implemented automaton to recognize tokens and a Shunting-Yard algorithm to compile mathematical expressions
- Created support for functions such as square-root and trigonometric functions using floating-point calculation

Technical Skills

Languages: C, C++, Java, Python, JavaScript, PHP, Assembly (AArch and x86_64)
Developer Tools: Git, Docker, Google Cloud Platform, VS Code, VIM, IntelliJ, Microsoft Office, Bash
Frameworks and Libraries: Node.JS, NoSQL, VueJS, React, Lex, YACC, pandas, NumPy, Matplotlib