Fatma Ayad

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EDUCATION

Bryn Mawr College | Bryn Mawr, PA **Expected Graduation:** Spring 2028

Bachelor of Arts in Computer Science, Minor in Astrophysics | GPA: 3.830

Relevant Coursework: Systems Programming, Data Structures and Algorithms, Discrete Mathematics, Intro to Computer Science

Activities: Girls Who Code, HaverCode, Rewriting the Code, FIRST Robotics, Kennedy-Lugar Youth and Exchange Scholarship

TECHNICAL SKILLS

Languages: Java, Python, C, C++, HTML, CSS, JavaScript, TypeScript

Libraries/Frameworks: React, Node.js, Next.js, D3.js, Pandas, NumPy, AstroPy, Matplotlib, Pygame, NCurses, JUnit

Developer Tools: Git, SSH, Tableau, Linux (Ubuntu), Vim, Bash, VSCode

EXPERIENCE

Machine Learning Research Assistant | Bryn Mawr College | Bryn Mawr, PA Jun. 2025 – Present

- Developed a **large-scale LLM benchmark** by transforming 1200+ GitHub pull request comments into 15 pair-programming questions across Java, C++, and Python enabling reproducible, **cross-model benchmarking** and revealing performance gaps in code reasoning.
- Designed and implemented a quantitative evaluation framework by developing rubrics and a numeric scoring system to systematically assess LLM performance, establishing standardized metrics across 8+ LLM models and 20+ model variants.
- Integrated manual-automated evaluation pipelines by leveraging Claude Opus 4 along with human validation, achieving **92% human-AI scoring agreement**, reducing assessment time per response by 70% and boosting benchmarking efficiency and reliability.

Digital Technology Intern | Bryn Mawr College | Bryn Mawr, PA May – Aug. 2025

- Collaborated with a 5-member team to convert 5 years of institutional data from static PDF tables into 20+ interactive web dashboards using Tableau and embedded them on the College's official website using HTML, increasing accessibility for **400+ regular users**.
- Analyzed and cleaned raw datasets across 10 categories using Excel through close collaboration with Bryn Mawr's Institutional Research department and applied **UI/UX principles** to enhance dashboard clarity and visual consistency.
- Presented the project along with the team at the Tri-Co Digital Scholarship Conference at Swarthmore and the ILiADS Conference at Bryn Mawr, highlighting technical and design methodology to a scholarly audience.

Data Structures Teaching Assistant | Bryn Mawr College | Bryn Mawr, PA Sep. 2025 – Present

- Mentored **50+ students** in data structures and algorithms (linked lists, trees, graphs) by conducting 5+ office hours, one-on-one tutoring, and code debugging in Java and Python, increasing assignment completion from ~70% to ~90% for mentored students.

Lab Technical Assistant | Haverford College | Haverford, PA Sep. 2025 – Present

- Resolved critical technical issues across SSH, Git, and multi-language development environments (Python, Java, C++), reducing average troubleshooting time by streamlining debugging workflows.

TECHNICAL PROJECTS

RubberDuckBench Website | TypeScript, HTML/CSS, React, Next.js, D3.js, ShadCN Dec. 2025 - Present

- Developed the frontend for a benchmark results website, building reusable UI components and improving page usability and navigation.
- Created interactive D3.js charts for model comparison, helping users interpret performance trends more easily.

Vimulater | C, NCurses Sept. 2025 – Nov. 2025

- Developed a Vim-inspired editor with core editor architecture and CLI workflows by applying low-level text processing techniques, enabling responsive CLI-based editing of large files and gaining experience in editor design and system-level programming.

Zork Adventure Game | Python, Pygame, Asciimatics Dec. 2024

- Deployed a full-featured text-based adventure game implementing object-oriented design principles and ASCII animations, demonstrating proficiency in Python game development and user interface design.

PUBLICATIONS

- Ferida Mohammed, **Fatma Ayad**, Satish Chandra, Petros Maniatis, Elizabeth Dinella
  "RubberDuckBench: A Benchmark for AI Coding Assistants."
  LLM4Code Workshop, co-located with the **International Conference on Software Engineering (ICSE)**, accepted, 2025.

LEADERSHIP

Head of Geniuses Robotics Team | Lybotics Organization | Tripoli, Libya Oct. 2022 – Jun. 2024

- Mentored and strategically guided a 12-member robotics team, placing 2nd in the regional FIRST Robotics competition.
- Successfully secured 10,000+ LYD funding from the US Embassy in Libya, supporting team's year-round development and operations.