Nyx Haile

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Education

Massachusetts Institute of Technology — Cambridge, MA
B.S., Computer Science, B.S., Mathematics, Minor in Economics — *Exp. Grad. May 2026*

Experience

Research Mentor — September 2023 – Present
The SHED — *Cambridge, MA*

- Served as a key mentor in a cutting-edge, interdisciplinary makerspace, guiding research projects at the intersection of biocomputing, human-computer interaction (HCI), and personal transportation.
- Provided comprehensive technical training to laboratory staff on advanced equipment, ensuring compliance with safety protocols and optimizing experimental outcomes.
- Spearheaded the design and execution of innovative research methodologies, employing data-driven decision-making to solve challenges in increasing makerspace access
- Collaborated with interdisciplinary teams to advance research in computational models, machine learning applications, and data analytics, supporting the integration of quantitative techniques in experimental workflows.

Undergraduate Researcher — June 2025 – Present
Weiss Laboratory for Synthetic Biology — *Cambridge, MA*

- Applied theoretical computer science techniques—including graph algorithms, spatial optimisation, and formal constraint modelling—to develop a generative design pipeline for biologically constrained microarchitectures.
- Integrated AI-based prompting with classical algorithmic tools to synthesise spatially feasible geometries under physical and physiological constraints, enabling rapid and adaptable iteration.
- Designed custom validation metrics and refinement algorithms grounded in discrete geometry and computational topology to ensure manufacturability and biological viability.
- Bridged computational design with experimental workflows by contributing to high-throughput analysis pipelines, including sequencing, imaging, and real-time control system interfacing.

AI Developer — December 2022 – July 2023
Vana — *Remote*

- Organized the Vana X MIT Generative AI Hackathon, managing a $25,000 prize pool and coordinating logistics, outreach, and judging criteria, resulting in the participation of top-tier talent from the MIT community.
- Designed, developed, and rigorously tested a robust framework for hackathon participants, leveraging JavaScript and Python to create an efficient and scalable platform for generative AI development.
- Created a messaging applet in Swift utilizing the Vana API, integrating user-friendly functionalities while ensuring seamless interaction between backend and frontend components.
- Engineered advanced prompt generation techniques for AI-generated stickers, ensuring stylistic cohesion and optimizing the balance between creativity and functional output.

Projects

Howtowin.lol | *Python, Redis, Svelte, OLAP DB* — July 2024– Present

- Developing a vector matching algorithm to identify and compare gameplay metrics with similar past matches.
- Building a website in Svelte to display data and manage user logins,
- Designing data visualization tools to present insights and recommendations to users effectively

Technical Skills

Languages: JavaScript, Python, C/C++/C#, SQL (Postgres), Redis, HTML/CSS,
Frameworks: React, Node.js, Svelte, Flask
Developer Tools: Git, *NIX, Docker, Google Cloud Platform
Libraries: pandas, NumPy, Matplotlib, TensorFlow
Tools: Fusion360, Adobe Suite, Arduino, Xcode

Relevant Coursework

6.5660, 6.5620, 6.5630, 18.032, 6.1010, 18.650, 6.1210, 18.06, 6.1200, 18.404, 14.01, [Descriptions Linked]