FRANCESCA N. VENDITTI

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U.S. Citizen

EDUCATION

Massachusetts Institute of Technology (MIT) Cambridge, MA

Candidate for *Bachelor of Science in Computer Science & Engineering* & Minor in Biology, Class of 2026

Selected Coursework: Software Construction, Low-Level Programming in C & Assembly, Algorithms & Data Structures, Probabilistic Systems and Analysis, Linear Algebra, Fundamentals of Programming, Discrete Math, Computer Science Programming in Python, Computational Thinking and Data Science, Calculus I & II, Physics I & II

Activities: MIT Society of Women Engineers, MIT Assistive Technology Club, MIT IEEE/ACM, MITxHarvard Women in AI, MIT Pre-Medical Society

SKILLS & ACCOLADES

Computer-Based Skills: Python, JavaScript/TypeScript, C, Assembly, Git/Github, Next.js, React, Tailwind CSS/CSS, MongoDB, Node.js, Express, zsh/bash, HTML, LaTeX, Agile, Adobe Premiere Pro/Photoshop, Microsoft Suite, software construction, some machine learning (ML) familiarity
Languages: English (native), Spanish (Maryland Seal of Biliteracy, proficient), Mandarin Chinese (beginner, independent study)
Leadership: MIT Society of Women Engineers Board Member (September 2022-current) – organize and pilot new programs for young women in STEM
Awards/Accomplishments: National Merit Scholarship Program Finalist, AP Scholar with Distinction, school-wide Sandra Lee Heyman Award for Higher Mathematics, President's Gold Award for Educational Excellence, Governor's Merit Scholastic Award, Potomac Valley Swimming Scholar-Athlete Award (4 yrs), International Baccalaureate Diploma (Richard Montgomery HS), 3x published author in the International Youth Neuroscience Association Journal

EXPERIENCE

Deloitte (June-August 2024) Rosslyn, VA

Solutions Engineering Intern

- Lead and collaborate with cross-functional teams on ***2 technical consulting projects*** as part of the Discovery II internship program
- Develop and implement contemporary solutions and software tailored to client needs for Application Modernization and Innovation in Core Business Operations, specifically working on a FEMA/Cloud DHS AI project involving ***1500+ assets*** valued at ***$90.2 million***

Koch Institute for Integrative Cancer Research (January 2023-2024) Cambridge, MA

ML & Software Undergraduate Researcher

- Analyzed ***6000+ -omics data points*** for the White Lab, and integrated KEGG and Cytoscape platforms to visualize ***5+ metabolic pathways***
- Designed and executed ***30+ clustering analyses***, used unsupervised machine learning to predict structural features that determine the functional role of pTyr in cancer metabolism by cross-referencing ***10+ experimental and computational datasets***; co-author of pending research publication

National Institutes of Health (NIH) (June-August 2023) Bethesda, MD

ML Intern

- Led a project analyzing axonal plasticity of neurons and integration of implanted brain tissue in different ages of mice using immunohistochemistry, anterograde/retrograde tracing methods, and ***image segmentation***/ML, improving data accuracy by ***10-15%***
- Contributed research findings to a forthcoming scholarly publication for the Functional and Molecular Imaging Lab, and presented to the NIH scientific community, receiving feedback from ***50+ experts*** and participated in ***30+ formal lectures, clinical cases, and symposia***

National Center for Advancing Translational Sciences (NCATS) (June-August 2022) Remote

Volunteer Consultant

- Guided the navigation of video editing software for a team of ***5 people***, identifying key themes for ***high-impact*** documentary series
- Coordinated technical support and training on video editing software, resulting in a ***30% reduction*** in production time

Angels for Alyssa MMA Research Foundation (June-November 2020) Remote

Technical Intern

- Created, managed, and produced a series of scientific documentaries, guiding patients with methylmalonic acidemia (MMA) and their families, resulting in ***500+ views*** and positive feedback – link: https://angelsforalyssa.com/mma-documentary-series
- Managed the patient-family website for ***50+ families*** and interviewed experts in the field to compile comprehensive knowledge of MMA and relevant treatments by taking on ***4 roles*** including Director, Main Editor, Screenwriter, and Audio Engineer

EXAMPLE PROJECTS

Overview: memory scramble, flashcards, & star battle games (concurrency, async, web APIs, mutable shared abstract data types, etc.), meme generation (language implementation), cityscape generation (immutable abstract data types), SAT solver, audio & image processing (incl. 3D engine), ML programs

Star Battle Game | TypeScript, Express, DOM Manipulation, Abstract Data Types, Software Construction, Git, Team Collaboration, Node.js

- Spearheaded and collaborated as part of a team on a client/server Star Battle puzzle GUI, adhering to a 10×10 2-star puzzle format with a unique solution, leveraging concepts from Software Construction such as parsing, abstract data types for representation, the DOM, and using Express for server requests while facilitating team collaboration and problem-solving through Git

Memory Scramble Game | TypeScript, Asynchronous Programming, User Interface Design, Concurrent Programming

- Developed a networked multiplayer Memory game handling concurrent players with an asynchronous, responsive game board for interactive users

Auto Meme Generation Tool | TypeScript, Domain-Specific Languages (DSLs), Parsing, Image Processing, Expression Representation, Software Design

- Created a comprehensive domain-specific language (DSL) for generating captioned image memes, encompassing parsing, expression representation, size computation, and image generation functionalities. Ensured robustness and flexibility by allowing expressions to include filenames, quoted strings for captions, and complex compositions of images and captions through operator precedence and grouping

AI Chatbot | Python, TensorFlow, Natural Language Processing (NLP), JSON Data Handling, Numpy

- Constructed a Python-based chatbot using TensorFlow for intent classification and response generation, trained on a custom JSON dataset, and used NLTK for natural language preprocessing, deployed locally