Emmanuela Ilok

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Bachelor of Science: Computer Science and Engineering *Expected Graduation: May 2028*
Relevant Coursework: Fundamentals of Programming, Discrete Mathematics for Computer Science, Low-level Programming in C and Assembly Language, Multivariable Calculus, Physics II.

Activities: Society of Women Engineers Technology Chair, NSBE Freshman Comm. Publicity Chair, MIT CodeForGood Executive.

TECHNICAL SKILLS

Skills: Python, C, Assembly Language, Data Structures and Algorithms, Machine Learning model development, Git, Python libraries HTML, CSS, JavaScript, Agile Project Management, Academic Research.

PROFESSIONAL EXPERIENCE

MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) Jan 2024- Present
Machine Learning Researcher
- Developed and implemented a Graph Neural Network model for fraud detection in credit card transactions for Itaú Unibanco, Brazil's largest private bank, utilizing Generative Adversarial Networks to address class imbalance in fraud datasets.
- Designed and optimized graph-based features to capture intricate relationships between graph nodes (credit card users and merchants), achieving 99.5% accuracy and 84.8% ROC AUC score.
- Leveraged Large Language Models (LLMs) to cluster semantic data specifically user jobs and merchant categories for input into the Graph Neural Network for model improvement.

Pioneer Academics Computer Science Research Program
Computer Science Researcher *Feb 2023 – July 2023*
- Developed a **91% accurate** deep learning model for early detection of cervical cancer in Python, using Python libraries (OpenCV, Pandas, NumPy and Scikit-learn), with the aim of addressing the inadequate cervical cancer screening services in my local area.
- First authored a research paper, evaluating machine learning vs deep learning based cervical cancer image classification.

CodED NGO
Founder *Dec. 2021 – Present*
- Established CodED to address the inadequate nature of computer science education in public schools in my local district.
- Designed a hands-on Computer science curriculum and led bi-weekly coding classes, teaching Python, HTML and CSS to 300+ high school students and 140+ visually impaired students. Raised $10,000 to expand CodEd's impact to other African countries.

PROJECTS

Project: Sokoban Puzzle Solver Feb 2025
- Developed a Sokoban puzzle solver in Python, utilizing graph search algorithms such as breadth-first search (BFS) to compute the shortest sequence of moves to the victory state.
- Designed an efficient game state representation in Python to minimize redundant calculations and track game configurations.
- Applied algorithmic problem-solving to model player and object interactions and complex victory conditions within the game.

Project: Movie Recommendation System November 2024
- Designed and implemented a movie recommendation system in Python using a bidirectional lookup table and object-oriented programming (OOP) to efficiently store and retrieve user ratings for personalized movie recommendations.
- Engineered collaborative filtering algorithms (user-to-user and item-to-item) using cosine similarity, applying OOP principles to structure the recommendation logic.
- Designed methods to predict ratings and recommend movies to aggregate user and movie ratings based on user or item similarity.

Project: Diary Management System October 2024
- Develop a digital diary management system in Python that allows users to add, view, edit, and search encrypted entries
- Implemented Caesar Cipher-based encryption and decryption algorithms to secure diary content, ensuring user privacy while preserving data integrity.
- Designed helper functions for text parsing, whitespace handling, and diary visualization to improve code usability and readability.

Project: Embedded C Snake Game Jan 2025
- Developed an interactive Snake game on an 8x32 LED matrix using ESP32, leveraging C for embedded systems programming.
- Implemented efficient bitwise operations for LED pixel manipulation, real-time movement tracking, and collision detection to ensure smooth gameplay.

HONORS & AWARDS

- **Honors:** 2022 Rise Global Winner (selected out of 80,000 applicants); Yale Social Impact Award; PTA Leadership Award
- **Scholastic Awards: #**1 Overall Best Student in Nation for Cambridge IGCSE Exams; 1st Place in Meadow Hall Mathematics Competition; High School Valedictorian; John Todd's Trophy for Science and Technology.