Madhavan Iyengar

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Education

University of Michigan — Ann Arbor, MI

BSE Computer Science, minor in Electrical Engineering – GPA: 3.98/4.00 — Aug 2021 - May 2025

Relevant Coursework: Data Structures & Algorithms in C++, Machine Learning, Computer Vision, Web Systems, Robotic Mechanisms, Computer Organization, Linear Algebra

Experience

Software Development Engineering Intern — May 2023 – Aug 2023

Amazon — *Ann Arbor, MI*

- Designed and implemented intuitive **ReactAPL** interfaces for Alexa multimodal devices such as Echo Show 15, enabling users to view status, control, and select favorite smart home devices in a single seamless user experience
- Optimized backend **Java** software, facilitating efficient request-response interactions between the frontend and backend and reducing data transfer loads by **50%**, improving system performance and reliability
- Designed and implemented custom internal interfaces that mirrored developers' appliances' states on the web, leading to an estimated **2-hour** reduction in smart home application development time

Student Researcher — Aug 2022 – Present

Situated Language and Embodied Dialogue Lab — *Ann Arbor, MI*

- Spearheaded design and implementation of data annotation pipeline for dialogue annotation using **React**, **Flask**, and **DynamoDB**, enabling intuitive annotation of **40,000** natural language utterances from the Echo Show
- Designed CICD pdipeline using **GitHub Actions**, resulting in reduction of deployment times by **10x**
- Leveraged annotated data to develop BERT-based model using **Huggingface** and **Pytorch Lightning** that achieved **90%** alignment with existing rule-based NLU techniques, improving Echo Show's understanding of human speech.
- Contributed to successful team effort that won Amazon's SimBot Prize Challenge, leading to a **$500,000** prize

Software Engineering Intern (Multidisciplinary Design Program) — Jan 2023 – Present

Subaru Research and Development — *Van Buren Twp, MI*

- Engineered intelligent self-opening car door that uses computer vision to identify driver identity and intent to enter the Subaru WRX, reducing entry time by **50%** and improving vehicle security
- Enabled hands-free operation, providing accessibility for **2.7 million** Americans with mobility-related limitations

Teaching Assistant — Jan 2023 – Present

University of Michigan — *Ann Arbor, MI*

- Delivered instruction in an upper-level Machine Learning class to a section of **30** students, covering topics such as regression, deep learning, clustering, recommender systems, Hidden Markov Models, and graph learning
- Developed class materials and conducted office hours, clarifying student doubts and furthering understanding

Projects

Reddit Post Classifier | *Scikit-learn, NumPy, MatPlotLib, NLTK*

- Built SVM-based machine learning model that classifies Reddit posts into various categories based on their content, allowing users to more easily search for what they are looking for, achieving >**80%** ground-truth accuracy

Covid-19 Spread Simulator | *MATLAB*

- Created **network-based SIR model** to simulate effects of different vaccination patterns on Covid-19
- Discovered pattern that reduced overall infection by **17%** when compared to existing methods, which could be used to more effectively distribute vaccines to a population in an epidemic

Search-and-Rescue Robot | *OpenCV, Arduino, Git*

- Designed and built prototype search-and-rescue robot designed to enter dangerous situations and locate survivors
- Developed face detection algorithm with **95%** accuracy and integrated photoelectric sensors for efficient navigation

Technical Skills

Languages: Python, C, C++, Javascript, Java, HTML/CSS, MATLAB/Simulink
Frameworks/Libraries: Git, PyTorch, OpenCV, Scikit-learn, NumPy, Pandas, NLTK, React, Flask, MongoDB