

Mayank Kumaran

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EDUCATION

University of Illinois, Urbana-Champaign

Champaign, IL

Bachelor of Science in Computer Engineering, Minor in Mathematics

Aug. 2022 – December 2025

Relevant Coursework: Data Structures; Probability and Statistics with Engineering Applications; Digital Systems Laboratory; Algorithms and Models of Computation; Numerical Methods; Analog Signal Processing; Competitive Algorithmic Programming, Artificial Intelligence

EXPERIENCE

Undergraduate Teaching Assistant

September 2024 – Present

University of Illinois Urbana-Champaign

Champaign, IL

- Assisted in teaching the course **ECE 385 Digital System Laboratory** by holding weekly office hours, helping students with assignments, and providing quiz preparation
- Collaborated with the professor and other TAs to develop additional instructional resources for labs

Research Intern

June 2024 – August 2024

Massachusetts Institute of Technology

Cambridge, MA

- Developing a lightweight open-source **Active Learning** package leveraging uncertainty sampling and k-center density clustering algorithms as query strategies, optimizing semi-supervised machine learning processes
- Enhancing a **Domain-Adapted Visual Learning Model** to accurately classify electrolyte structures to improve prediction of electrolyte usage
- Co-authored a paper on **Contrastive Learning** for multi-modal representations of crystals, focusing on articulating complex computer science concepts

Software Engineer

Sep. 2023 – January 2024

Disruption Lab at Gies Institute

Champaign, IL

- Developed a **Github API** using **PyGithub** to interface with a Kubernetes backend for allocating cloud resources to data science projects, enabling remote execution of data science tasks
- Integrated the custom Github API with a SlackBot using **Bolt API** to streamline user interfacing for internal users, optimizing the DSRS infrastructure by 30%
- Created a chatBot using **OpenAI GPT-4** and implemented it into a **Streamlit** interface, assisting users with DSRS services and improving user support

Embedded Software Engineering Intern

May 2023 – July 2023

Ion Mobility

Singapore, SG

- Developed an MQTT Client Shell in **C** to interface a microcontroller in an electric motorcycle using **CAN** bus sensor data to enhance data collection
- Integrated **AT-Commands** for modem control and implemented SSL encryption using **OpenSSL** with **Mainflux** IoT middleware, improving data security and device management
- Tested the client on a custom VCU, enabling reliable data transfer via **USB** and **UART** protocols, resulting in successful deployment and detailed documentation for future reference

PROJECTS

2D Fighter Game | *JavaScript, Node.js, Firebase, Websockets, Photoshop*

January 2023 - Present

- Project lead of team of 5 for 2D fighter game written in **vanilla JS** and hosted on a **React** server
- Uses **Firebase** and **Websockets** to provide for authentication and online play respectively

NLP Trading | *Python, Pandas, NLTK, BeautifulSoup*

April 2023 - April 2023

- Developed a web scraping algorithm using **BeautifulSoup** to get up-to-date stock data
- Used **Pandas** to store and preprocess the data to scale the importance of variables by different criteria and conducted sentiment analysis using **NLTK** to determine the trajectory of a given stock

TECHNICAL SKILLS

Languages: SystemVerilog, Python, C/C++, JavaScript, HTML/CSS, Swift

Frameworks: React, Node.js, Flask, WordPress, Firebase

Developer Tools: Git, Docker, Vivado, Xilinx SDK, VS Code, Quartus, PyCharm, Gazebo, Eclipse, Unity

Libraries: Pandas, NumPy, SciPy, SymPy, Matplotlib, NLTK, BeautifulSoup, PyTorch