Shanav Bagga

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EDUCATION

University of Illinois at Urbana-Champaign **Champaign, IL**
Bachelor's of Science in Statistics, Minor in *Computer Science* **Expected Graduation:** May 2025
Relevant Courses: **GPA:** 3.80 / 4.00
Introduction to Computer Science I & II Honors, Data Science Discovery, Statistics and Probability I & II, Discrete Structures, Data Structures & Algorithms, Computer Architecture

EXPERIENCE

Introduction to Computer Science II, *Course Assistant* ***August 2023 - Present***
- Held weekly office hours to assist students in understanding key C++ concepts such as compilation, references, pointers, stacks, queues, trees, graph theory, polymorphism, file streams, and dynamic memory
- Guided students through writing efficient test cases that would aid them in thoroughly debugging their code
- Ran weekly lab sections which reviewed concepts covered and prepared students for their projects

AI Camp, *Data Science Intern* ***May 2023 - Present***
- Implemented a Chatbot in Python through Streamlit that allows users to upload files and query them
- Utilized a variety of combinations of Llama Index, Langchain, Pinecone, and OpenAI's API to create multiple different query engines that each suite a unique task and prompt users to select which engine to use
- Split the inputted file into a doubly linked list of nodes through Llama Index where each node contains vector embeddings of its chunk of text created through API calls to OpenAI's Text Embedding Ada model
- Created an automated test suite on the SQUAD dataset by iterating through each node, asking OpenAI's API to create a question, storing the question, response, context used, and score. Calculated the median score of the Llama Index and Pinecone query engine across 1000 queries to be 0.895
- Leveraged Llama Index's Response Evaluator to determine whether the response was strictly using the context given and informed the user if the query was unable to be answered solely with it

Introduction to Computer Science I, *Course Assistant* ***January 2023 - May 2023***
- Spent several hours on a weekly basis teaching introductory Java programming concepts to students
- Interacted with students through course help site meetings and forum discussions

PROJECTS

Alpaca Trading Model - https://github.com/Shanav12/Alpaca_Trading_Model ***August 2023***
- Implemented a deep learning model using multiple LSTM layers in Keras and stock data through Alpaca's API to analyze stock data for a variety of tickers from the Q1 in 2022 until present
- Predicted the next 10-day moving average for each ticker and invested in approximately $50000 worth of long or short positions for each ticker
- Determined which position to take by comparing the model's forecast to the current 10-day moving average

Taylor Swift Lyric Generator - https://github.com/Shanav12/ShakespeareSonnetGenerator ***July 2023***
- Utilized GPT-2 embeddings and the GPT-Neo model from Hugging Face to implement a full-stack website using HTML, CSS, and Flask that outputs lyric in the style of Taylor Swift
- Preprocessed the dataset containing lyrics from her six best-selling albums by reformatting each sequence to contain 4 lines of lyrics and removed sequences with outlier lengths or overly repetitive tokens
- Deployed the trained model which had a training loss of 0.138 to HuggingFace and fine-tuned the output of API calls by adjusting hyperparameters such as max tokens and repetition penalty

Sports Ball CV Classification - https://github.com/Shanav12/SportsBallClassificationCV ***May 2023***
- Implemented a computer vision classification model in Python that takes prompts the user to upload an image of a sports ball and outputs the probability of which type of sports ball it could be
- Used Roboflow to classify images and create the train, test, and validation datasets, uploaded the trained model to Hugging Face, and interacted with it through API calls
- Built the frontend through HTML and CSS and implemented the backend using Flask

SKILLS & AWARDS

Languages: C++, Python, Java (Proficient), Rust, SQL, R (Comfortable), HTML, Javascript, CSS (Familiar)
Technologies: Github, Flask, Hugging Face, Docker, AWS, React, Tensorflow
Awards & Recognitions: James Scholar Honors Student, Fall 2022 Dean's List