

# ABHINAV KAPAVARAPU

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## EDUCATION

University of Florida, Gainesville, FL

Masters in Computer and Information Science and Engineering

Aug 2023 - May 2025

CGPA: 3.92/4.0

Anurag Group of Institutions, Hyderabad, India

Bachelors in Electronics and Communication Engineering

Aug 2019 - Jun 2023

CGPA: 8.06/10

## EXPERIENCE

The Hackett Group

Project Trainee Intern

Mar 2023 - Apr 2023

Hyderabad, India

- Gained practical **Machine Learning** expertise through projects such as **Sentiment Analysis** using around 500 customer reviews to interpret sentiments and **Market Mix Modeling** to analyze around 10 key sales drivers.
- Completed a project analyzing around 100 employee records to identify stress triggers, utilizing data analytic tools to highlight potential stress factors, contributing to ongoing research on workplace wellness.

## PROJECTS

Food Delivery Web Application | React, HTML, CSS, Node.js, Express, MongoDB

Oct 2024

- Designed a responsive frontend using **React, HTML, and CSS**, featuring an engaging **home page**, **menu filtering by category**, and a **checkout page** to enhance the overall experience.
- Developed backend architecture with **Node.js and Express**, creating robust **RESTful API endpoints** for efficient request processing and data retrieval from **MongoDB Atlas**.
- Implemented secure **authentication and authorization** workflows via **JSON Web Tokens (JWT)**, enabling seamless account management and session handling.
- Integrated an **AI chatbot** powered by **OpenAI GPT-3.5 Turbo API** to provide **personalized food recommendations** and handle **queries**, enhancing engagement.

Personalized News Categorization | Python, Natural Language Processing (NLP), Large Language Models

Apr 2024

- Developed a personalized news delivery system based on **Retrieval-Augmented Generation (RAG)**, tailoring content retrieval to individual profiles.
- Enhanced categorization and content distribution by applying **prompt generation** techniques and fine-tuning the **Flan-T5-base model** with a learning rate of  $3e-4$  over 3 epochs, optimizing performance and engagement.
- Improved retrieval mechanisms through the **BM25 algorithm**, ensuring alignment between preferences and news content while optimizing model performance.

Remote Sensing Image Captioning using Deep Learning | Python, Pandas, TensorFlow

Mar 2024

- Led a deep learning initiative to generate precise and contextually relevant captions for a dataset of 1,680 remote sensing images, improving the interpretability of complex spatial data.
- Implemented **Convolutional Neural Networks (CNN)** featuring the **RESNET 152** architecture for feature extraction and integrated them with **Long Short-Term Memory (LSTM)** units in **Recurrent Neural Networks (RNN)** to produce coherent image captions, leveraging **TensorFlow** for development.
- Assessed the model's performance rigorously with industry-standard metrics, achieving a **BLEU-1 score of 0.7** and **CIDEr score of 2.38**, ensuring both accuracy and contextual relevance in the captions.

Protein-Protein Interaction Prediction | Python, Biopython, Pandas, Scikit-Learn

Feb 2024

- Preprocessed a balanced dataset of **73,000 protein interaction pairs**, ensuring **bias-free model training** through data cleaning, labeling, shuffling, and standard scaling.
- Engineered a **feature extraction pipeline** using **Biopython**, computing **7 key features** such as sequence length, molecular weight, amino acid composition, and secondary structure fractions.
- Designed and evaluated **three classification models (SVM, Random Forest, XGBoost)**, achieving **97.77% test accuracy** with XGBoost, outperforming other models.
- Analyzed **feature importance** using **Random Forest and XGBoost**, identifying **coil fractions, sheet fractions, molecular weight, and sequence lengths** as the most significant factors in **PPI classification**.

## TECHNICAL SKILLS

Languages: Python, C, Java, F#, SQL, JavaScript

Web Frameworks and Databases: Node.js, Express, React, Django, HTML, CSS, MongoDB, MySQL

Tools and Cloud Technologies: AWS, IBM Cloud, GitHub, VS Code, Postman, Android Studio, Microsoft Office