ABHINAV KAPAVARAPU

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EDUCATION

University of Florida, Gainesville, FL 08/2023 - 05/2025
Masters in Computer and Information Science and Engineering *CGPA: 3.93/4.0*

Anurag Group of Institutions, Hyderabad, India 08/2019 - 06/2023
Bachelors in Electronics and Communication Engineering

TECHNICAL SKILLS

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

Web Development: HTML, CSS, React, Node.js, Express

Backend Frameworks: FastAPI, Django, JWT, Axios

Machine Learning: Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, TensorFlow, PyTorch, OpenCV, Hugging Face, FAISS, RAG

Cloud & DevOps: AWS, IBM Cloud, Firebase, Docker, Render, Vercel, Railway

Databases & Tools: MongoDB, MySQL, GitHub, VS Code, Postman, Microsoft Office

Certifications: AWS Certified Cloud Practitioner, NVIDIA Certified - Building Transformer-Based NLP Applications, NVIDIA Certified - Fundamentals of Deep Learning

EXPERIENCE

The Hackett Group 03/2023 - 06/2023
Intern *Hyderabad, India*
- Built end-to-end **ML** solutions incl. **Sentiment Analysis** on 500+ reviews and **Market Mix Modeling** with 10+ sales drivers.
- Cleaned and processed complex business datasets using advanced **feature engineering** to improve model performance.
- Implemented diverse **NLP techniques** to boost accuracy and interpretability in customer review analysis.
- Installed end-to-end ML backend on **AWS EC2** as RESTful APIs to enable scalable, production-grade access.
- Analyzed cross-sectional employee data to uncover key **stress-related factors** impacting workplace dynamics.

PROJECTS

AI Study Tutor Agent | *Python, FastAPI, React, OpenAI, FAISS* 06/2025 - 07/2025
- Engineered an AI tutor with **FastAPI** and **React** for document-based Q&A and quizzes in **3 formats**.
- Spearheaded **RAG** using **Sentence Transformers** and **FAISS**, enabling sub-second semantic search over embedded text chunks.
- Integrated **GPT-3.5-turbo** for contextual answers and auto-generated **50+ MCQs** with adaptive feedback.
- Tracked progress via **Firebase Firestore** to identify weak topics, boosting concept revision by **2x**.
- Deployed full-stack app on **Render.com** with scalable **FastAPI** and **React** services for real-time, cross-platform access.

Research Paper Summarization and Query Answering System | *Python, T5, FAISS, GPT-3.5, spaCy* 01/2025 - 02/2025
- Fine-tuned **T5-small** on **75k documents** for abstracted summarization using step size **3e-4**, batch size **4**, for **3 epochs**.
- Achieved **ROUGE-1: 16.68** and **ROUGE-2: 5.84**, indicating strong summary generation.
- Designed **RAG** using **FAISS** and **Sentence-Transformer** embeddings for fast, context-aware summary retrieval.
- Enhanced summary quality and contextual relevance by integrating retriever-generated context with **OpenAI GPT-3.5**.
- Launched an interactive QA system with **spaCy**-powered pre-processing and a lightweight **Streamlit** interface.

Food Delivery Web Application | *React, HTML, CSS, Node.js, Express, MongoDB* 09/2024 - 10/2024
- Designed a responsive UI in **React, HTML, and CSS** with menu filtering, checkout flow, and an engaging homepage.
- Developed backend services using **Node.js, Express**, and **MongoDB Atlas** with scalable **RESTful APIs**.
- Implemented secure **JWT**-based authentication and role-based authorization for protected user operations.
- Deployed the **frontend on Vercel** and **backend on Railway** for seamless, cloud-based accessibility.
- Integrated an **AI chatbot** using **GPT-3.5 Turbo** to deliver personalized food suggestions and real-time support.

Personalized News Categorization | *Python, Flan-T5-base, spaCy* 02/2024 - 04/2024
- Created a personalized news system using a **RAG-like architecture** in **PyTorch** for targeted retrieval and summarization.
- Fine-tuned **Flan-T5-base** via **Hugging Face** at **3e-4** for **3 epochs**, improving accuracy by **50%**.
- Enhanced retrieval with the **BM25 algorithm** to better align results with user preferences.
- Applied **synonym-based query expansion**, achieving an additional **10%** gain in retrieval accuracy.
- Benchmarked pipeline variants to evaluate impact of **fine-tuning** and **synonym expansion**.