

ABHINAV GUPTA

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CS Engineer with **2+ years** of hands-on experience in solving problems with **Software Engineering, AI/ML and Data**. Proven track record of delivering high-quality solutions, designing robust systems, and working cross-functionally in fast-paced environments.

EDUCATION

University of Southern California

Master of Science – Computer Science

August 2023 – May 2025

GPA: 3.85/4.0

Vellore Institute of Technology, India

Bachelor of Technology – Computer Science Engineering

July 2019 – April 2023

GPA: 9.05/10.0

SKILLS

Languages: Python (Pandas, NumPy, Scikit-learn), JavaScript, TypeScript, Java, SQL, Flask (Streamlit), C++

ML Frameworks: PyTorch, TensorFlow, HuggingFace, LLMs, OpenAI API, LangChain, LangGraph, RAG, Prompt Engineering

MLOps & Cloud: AWS (Bedrock, EC2, Lambda, SageMaker), GCP, Azure, Docker, GitHub Actions, MLflow, CI/CD

Data: MySQL, MongoDB, Postgres, Firebase, Redis, DynamoDB, Power BI, Tableau, MATLAB

Tools: Postman, Salesforce, MediaPipe, Snowflake, Django, NodeJS, Airflow, REST APIs, FastAPI, PySpark, Hadoop

WORK EXPERIENCE

AI/Data Scientist

June 2024 – August 2024

Esri

Redlands, CA

- Developed a time series forecasting model using **Meta Prophet in Python** and integrating data from Khoros API to predict user engagement and calculating cost-impact with 90% accuracy, outputting insights for better informed business planning
- Designed a user retention model using **decision trees** mapped on features engineered based on engagement, transforming insights into automated Power-BI reports that assist in refining targeted content strategy and reduce churn risk
- Modified rule based with **LLM-powered** content moderation system on Khoros Care by **fine-tuning Llama** on internal dataset of transcribed data to detect & flag suspicious spam & bot-generated content on Esri Community increasing efficiency by 60%

Research Assistant - MLE

August 2023 – December 2023

USC Information Sciences Institute

Los Angeles, CA

- Engineered a natural language pipeline to generate vector embeddings of aviation incident reports using a **BERT-based** model in **PyTorch** that are fed into **Gaussian Mixture Model** for probabilistic clustering to categorize and assess leading factors
- Generated high-quality labels and developed a **multi-class classification** model with F1 macro score of 0.86 to automatically tag new incident reports; furthermore, deployed containerized model with a **Streamlit** web-app for easier interaction with model
- Built a data preprocessing pipeline using **Pandas and NumPy** to filter and transform 200k records, and extended to include EDA insights on ASRS dataset mapping incident cause and trend analysis as well as visualizing model output

Software Developer Engineer

October 2020 – March 2022

Learn with Leaders

Delhi, India

- Designed and deployed a full-stack web application using **Flask (Python), JavaScript, and Firebase Auth**, with dual view for participant and admin to support a global entrepreneurship competition with 10,000 participants, leading 3 interns
- Implemented **backend logic and database operations** using Firebase Realtime Database to automate participant registration, progress tracking, and performance reporting, enabling real-time updates and reducing manual overhead
- Developed a centralized performance dashboard in Power BI supported by **SQL database**, integrating data from 175,000 students, reducing fragmentation across teams, and drive a 40% increase in web traffic and a 30% lift in conversion rates

PROJECTS

Auto-DocGen – AI Powered API Documentation Pipeline

- Built an **AI CLI** to parse Flask apps using AST and generate OpenAPI 3.0 docs via a **Pydantic** agent with GPT-3.5-turbo
- Automated Swagger UI and **CI/CD workflows** to keep interactive API docs always up-to-date and browser-accessible

Multimodal SignToText Retrieval with Enhanced Facial Features

- Addressed absence of facial features in Sign Language Recognition using **PyTorch, MediaPipe & Transformer-based CLIP**
- Transformed 80hrs of video to extract landmarks, design hand-pose-face features & process raw frame data for Fusion model
- Achieved 30% higher Recall in SLR with explicit non-manual cues by training multimodal **video-to-text (V2T)** retrieval model

CityBot

- Built a serverless chatbot using **AWS Lex V2 & Lambda** to get shortest-path queries over **DynamoDB** stored network graphs
- Designed an API** to parse directed graphs, compute shortest paths using BFS, ensuring stateless Lambda with data refresh

Mitigating Catastrophic Forgetting in Continual Learning

- Solved challenge of catastrophic interference in class-incremental & task-agnostic continual learning using PyTorch, Dynamic Layer Expansion, **Variational Autoencoders and Generative Adversarial Networks** balancing stability and plasticity
- Applied CL to classify 10 tasks with 10 classes on CIFAR100, achieving benchmark of 68% accuracy- 6 times that of Vanilla NN