

# Gayathri Akkinapalli

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## Education

**University of Massachusetts Amherst (UMASS)** | MS in Computer Science | CGPA: 4.0/4.0

Sep 2023 - May 2025

**Indian Institute of Information Technology (IIIT)** | B.Tech in Computer Engineering | CGPA: 9.07/10.0

Aug 2017 - May 2021

## Publications & Preprints

- LS-GAN: Human Motion Synthesis with Latent-space GANs IEEE WACVW '25
- PerFine: Iterative Critique-Refine Framework for Enhancing LLM Personalization arXiv:2510.24469
- Safe to Serve: Aligning Instruction-Tuned Models for Safety and Helpfulness arXiv:2412.00074
- Automated Model Selection for Tabular Data arXiv:2401.00961

## Technical Skills

**Programming Languages:** Python, R, C, HTML, SQL, MySQL, NoSQL | Familiar: Java, C++, PHP, CSS, JavaScript, C#

**Tools/Libraries:** LangChain, MCP, Unslot, OpenAI, Wandb, Keras, PyTorch, TensorFlow, PySpark, SKLearn, NumPy, vLLM, Copilot

**Software/Frameworks:** Docker, Kubernetes, Kafka, Flask, FastAPI, gRPC, AWS, Splunk, MongoDB, Tableau, CI/CD, Snowflake, FAISS

## Professional Experience

**Gen AI Engineer Volunteer** | UMass Amherst

Aug 2025 - Present

- Built EduNotes, a multi-agent RAG study assistant using hybrid LLM setup (Groq Llama-3.1-70B API, local Flan-T5) with LangChain & ChromaDB, coordinating retriever, scraper, summarizer, note-maker agents via async pipeline, query routing, with 85% retrieval accuracy.
- Integrated AI-generated flashcards, quizzes, progress analytics via FastAPI & Streamlit UI, reducing note generation time by 70%.

**Graduate Student Researcher** | Cisco

Jan 2025 - Jul 2025

- Developed PerFine, a training-free critique-refine Agentic RAG framework for enhancing personalization in long-text using LangChain.
- Evaluated using LLM-as-a-Judge (G-Eval), improving personalization by 13% and Meteor by 10% over RAG-based baselines.
- Enhanced outputs with profile-grounded critic feedback retrieved via Pinecone (VectorDB), FAISS, MCP refining style, content relevance.

**Research Assistant** | UMass IESL Lab

Aug 2024 - Dec 2024

- Implemented autoregressive model that performs lookahead by decoding in superposition with two forward passes using cross attention.
- Applied approach to machine translation, improving BLEU score and generation quality of MT5 model by approximately 15%.

**Machine Learning Engineer** | Carelon Global Solutions

Jun 2021 - Jul 2023

- Designed Aspect-Based Sentiment Analysis on call transcripts using RoBERTa, BERT, SpaCy, achieved 85% accuracy & 0.81 F1-score.
- Built Recommendation Systems using NER, SpaCy & ML models like XGBoost, LightGBM in PySpark improving NDCG@5 by 75%.
- Used AWS SageMaker, Kubeflow, S3, GlueDB for model development and built Conversational AI bot resolving 65% of patient queries.
- Integrated web-scraped healthcare articles into Elasticsearch with ranking optimization, reducing content retrieval time to ~120ms.
- Deployed models into ENSO ML pipeline using RabbitMQ, Kubernetes, Kafka, cutting deployment time by 70% via CI/CD pipelines.
- Integrated REST APIs via Flask for end-to-end model automation using Hive, MongoDB, Redis, reduced care plan creation time by 2hrs.
- Created Splunk Dashboard for user feedback KPIs, ran A/B testing on recommendations, driving 60% improvement in model performance.
- Built Lambda functions to extract conversational data from IBM Object Storage to S3 and moved it into DynamoDB using AWS Glue.
- Deployed ETL pipelines and ML models using Google Cloud Vertex AI with Airflow for orchestration, Docker containerization.

**AI Engineer Intern** | SensorDrops Networks (STEP at IIT Kharagpur)

Aug 2020 - Sep 2020

- Designed real-time Social Distance Monitoring system using YOLOv3 with live feed, bounding boxes, 90% detection accuracy.
- Deployed application on AWS EC2 with Docker, enabling real-time analytics with 200ms latency via socket-based data transfer.

**AI Engineer Intern** | Centre for Development of Advanced Computing (C-DAC)

May 2020 - Aug 2020

- Developed prototype of customized deep CNN model to identify COVID-infected chest X-rays with accuracy of around 92%.
- Trained model on High Performance Computing (HPC) for three chest X-ray classes, achieving validation F1-score of 0.9.

## Academic & Research Projects

**Aligning LLMs towards safety and helpfulness** | UMass | Github

- Aligned LLaMa-2 toward safety using LoRA, QLoRA on PKU-SafeRLHF benchmark with SFT, RAFT, RLHF, DPO in Unslot & TRL.
- Scored 93% safe on DPO (40% SFT) with Llama-Guard on I-CoNa. Employed LLM-as-a-judge to evaluate safety and helpfulness.

**Human Motion Synthesis with Latent-space GANs** | UMass | Github

- Generated text-to-motion sequences in latent space utilizing GANS, VAE, CLIP on HumanML3D with Distributed training in lightning.
- Achieved FID of 0.48 with GAN in latent space with 91% in FLOPs reduction compared to Latent Diffusion Model on HumanML.

**Real time Stock Analysis** | UMass | Github

- Built Kafka, PySpark pipeline for Stock news analysis using LLaMa. Achieved 84% match with GPT-4 reducing processing time by 40%.
- Integrated with a RAG framework for financial information retrieval (dense + keyword search), securing a further 5% increase in accuracy.