

# 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 | <i>arXiv:2510.24469</i> |
| • Safe to Serve: Aligning Instruction-Tuned Models for Safety and Helpfulness    | <i>arXiv:2412.00074</i> |
| • Automated Model Selection for Tabular Data                                     | <i>arXiv:2401.00961</i> |

## 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

- Designed EduNotes, a multi-agent RAG study assistant, building a personal KB from lecture materials with hybrid LLM (Llama-70B API, Flan-T5), LangChain, ChromaDB, orchestrating retriever, scraper, summarizer, note-maker agents for on-demand retrieval.
- Implemented AI-generated flashcards, quizzes, notes, summaries via FastAPI & Streamlit, cutting note generation time by 70%.

**Graduate Student Researcher** | Cisco

Jan 2025 - Jul 2025

- Developed PerFine, a training-free critique-refine framework for personalized long-text via iterative profile-grounded feedback using FAISS, MCP. Improving personalization by 13% and Meteor 10% over baselines with LLM-as-a-Judge (G-Eval) evaluation.

**Research Assistant** | UMass IESL Lab

Aug 2024 - Dec 2024

- Implemented an autoregressive model performing lookahead via superposition decoding with cross attention in 2 forward passes, improving BLEU score and generation quality of the MT5 model by 15% on machine translation tasks.

**Machine Learning Engineer** | Carelon Global Solutions

Jun 2021 - Jul 2023

- Built Recommendation Systems using NER, SpaCy & ML models like XGBoost in PySpark improving NDCG@5 by 75%.
- Integrated REST APIs via Flask for end-to-end model automation using Hive, MongoDB, Redis reducing careplan creation time by ~2hrs through automated recommendations.
- Performed Aspect-Based Sentiment Analysis on call transcripts with RoBERTa, SpaCy, achieved 85% accuracy & 0.81 F1-score.
- Developed Conversational AI bot using DistilBERT for intent classification and BERT QA for extractive question-answering with RAG from S3 on SageMaker, Kubeflow, resolving 65% of patient queries across 1000+ daily interactions.
- Integrated web-scraped healthcare articles into Elasticsearch with ranking optimization, reducing content retrieval time by 120ms.
- Deployed models into ENSO ML pipeline with RabbitMQ, Kubernetes, Kafka, cutting deployment time by ~70% via CI/CD pipelines.
- Created Splunk Dashboard for user feedback KPIs, ran A/B testing with feedback-based model tuning on recommendations, driving 60% improvement in performance.

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

Aug 2020 - Sep 2020

- Modeled real-time Social Distance Monitoring system leveraging YOLOv3 with live feed, bounding boxes, 90% detection accuracy.
- Deployed application on AWS EC2 and 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

- Created a 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, obtaining 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 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.
- Secured FID of 0.48 for GAN in latent space with 91% FLOPs reduction compared to Latent Diffusion Model on HumanML.

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

- Devised a Kafka-PySpark pipeline for stock news analysis using LLaMA, achieving 84% GPT-4 alignment and 40% faster processing.
- Integrated a hybrid RAG retrieval system (dense + keyword search) for financial information, improving accuracy by an additional 5%.