Sai Gopal Reddy Kovvuri

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Education

Carnegie Mellon University Aug 2025 – Dec 2026 | Pittsburgh, PA
Master of Science, Computational Data Science
Current Coursework: Machine Learning, Search Engines, Large Language Models Methods and Applications

Shiv Nadar Institution of Eminence Deemed to be University Aug 2020 – May 2024 | Delhi NCR, India
Bachelor of Technology, Computer Science and Engineering
Minor: Mathematics, Specialization: Machine Learning, CGPA: **9.12**/10 (**High Distinction**)

Skills

Programming Languages: Python, Java, JavaScript
Libraries & Frameworks: PyTorch, Node.js, scikit-learn, Hugging Face, NumPy, Pandas, Flask, FastAPI, FAISS
Cloud & Databases: AWS, Azure, MySQL, PostgreSQL, MongoDB, Redis
Developer Tools: Git, Docker, Jenkins, Kibana

Professional Experience

Product Engineer - 1 Jun 2024 – Jul 2025 | Bangalore, India
Juspay Technologies
- Integrated 6 payment gateways into the company's payment orchestrator and maintained related business logic, focusing on encryption methodologies responsible for protecting transaction integrity.
- Enabled "On-Us" transaction processing for HSBC, cutting network transaction fees of 0.7% per transaction through direct in-network routing optimization.
- Initiated the development of "CodeGen", an internal tool by using RAG and instructing LLMs on existing codebase, automating 28% of payment gateway integrations reducing developer effort.

Product Engineer Intern Dec 2023 – May 2024 | Bangalore, India
Juspay Technologies
- Contributed to microservices handling 175M+ daily transactions by implementing new requirements, resolving production issues, and enhancing system reliability.
- Utilized Kibana for transaction log analysis and visualized Redis cache performance per API flow through structured logging, enabling faster detection of caching inefficiencies.

Data Science Intern Jul 2023 – Aug 2023 | Remote
Code for GovTech 2023 (Open Source Program)
- Developed an automated system for on-demand data generation and fine-tuning of Hugging Face models via user prompts, enhancing accessibility and efficiency of machine learning workflows.
- Utilized Stanford NLP's Demonstrate-Search-Predict framework to better LLM's response on government schemes.
- Created a custom scoring function based on fuzzy matching, improving document retrieval of untrained Indian rural village names by 35%.

Projects

QryEval (Search Engines - CMU) Sep 2025 – Nov 2025
- Built an end-to-end search engine with doc-at-a-time retrieval, BM25/Boolean models and structured operators.
- Added pseudo-relevance feedback (Okapi/RM3), improving MAP/NDCG over BM25 baselines on TREC-style queries.
- Implemented a BERT reranker, LTR reranker with SVMRank and RankLib using 20 custom features.
- Extended the pipeline with dense vector first-stage ranking and a RAG agent stage, architected for neural retrieval and generative output; automated experiment pipelines for reproducible results.

Publications

Prabhakar, M., **Reddy, K.S.G.** and Mukherjee, S., 2025, March. **Revisiting Subject-Action Relevance for Egocentric Activity Recognition**. In *2025 National Conference on Communications (NCC)* (pp. 1-6). IEEE.
- Led the design of a dual-stream CNN-LSTM model for egocentric activity recognition; achieved a +12.9% accuracy gain over I3D on EGTEA+, using only RGB and optical flow inputs.

Reddy, K.S.G., Bodduluri, S., Adityaja, A.M., Shigwan, S., Kumar, N., Mukherjee, S., 2024, November. **UnSeGArmaNet: Unsupervised Image Segmentation using Graph Neural Networks with Convolutional ARMA Filters**. In 2024 *British Machine Vision Conference (BMVC'24), Glasgow, UK.*
- Developed an unsupervised segmentation framework combining ViT features with ARMA-based GNNs; delivered a ~3% mIoU improvement on medical and natural image datasets, outperforming multiple SOTA baselines.