Gopi M

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Education

Amrita Vishwa Vidyapeetham, Coimbatore 2022 – 2027
Integrated MSc Data Science *CGPA: 7.12*

Sri Vijay Vidyalaya, Dharmapuri 2022
Higher Secondary Education *80%*

Experience

Machine Learning Engineer Intern Nov 2024 – Jun 2025
Resilience Business Grids LLP *Coimbatore*

- Worked on computer vision and deep learning projects involving model training, evaluation, and deployment using Python, Django, and React.
- Designed and implemented machine learning models and optimized hyperparameters for production systems
- Collaborated with development teams to deliver machine learning solutions within project timelines

Projects

Navigator – AI Desktop Automation Assistant | Electron, React, Node.js, TypeScript, Playwright

- Developed an agent-based AI desktop automation system capable of executing browser tasks, local file operations, and document generation using LLM-powered agents.
- Integrated multiple MCP servers enabling extensible AI agent orchestration and cross-platform control through Telegram integration.
- Designed a permission based system with encrypted API key storage and real time task execution interface

Toxicity Reduction in Falcon 7B using RLAIF | Python, PyTorch, HuggingFace, QLoRA, PPO

- Developed an ethical AI system to reduce toxic and biased outputs in legal large language models (Falcon 7B) for Indian law applications.
- Implemented Constitutional AI principles and a Reinforcement Learning from AI Feedback (RLAIF) pipeline using Proximal Policy Optimization (PPO) for scalable model alignment.
- Fine-tuned the model using Quantized Low-Rank Adaptation (QLoRA) on Indian legal datasets (MILDSum), achieving 75% reduction in toxicity while retaining 92% accuracy.

Publications & Research

VG-RAG: Verification-Gated Retrieval-Augmented Generation Jan 2026 – Present
Manuscript under review

- Proposed a retrieve-verify-generate architecture to improve reliability in retrieval-augmented generation (RAG) based LLM systems.
- Designed a verification scoring system combining semantic relevance, internal consistency, and cross-chunk agreement to filter unreliable retrieved documents.
- Implemented multi-phase validation with conditional web verification to ensure only verified evidence reaches the generation model.

Technical Skills

Programming: Python, SQL, R
Machine Learning: Deep Learning, Natural Language Processing (NLP), Model Evaluation, Hyperparameter Optimization
LLM & AI Systems: Retrieval-Augmented Generation (RAG), LLM Fine-Tuning, AI Agents, LangChain
Statistics & Data Analysis: Statistical Analysis, Hypothesis Testing, Probability, Exploratory Data Analysis (EDA)
Frameworks: React, Node.js, Flask, FastAPI, Django
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn, PyTorch
Tools & Platforms: Git, Docker, AWS, Google Cloud Platform

Achievements

3rd Place – Code O'Clock National Level Hackathon (SaaS22 x CIT) 2025

- Secured 3rd place among 92 teams for building "Mentora", an AI-powered platform that generates structured courses from PDFs, text, and video content.
- Built a working prototype within 24 hours using LangChain, ChromaDB, and Gemini API, featuring automated quiz generation, flexible content formats, and multilingual support.

1st Place – Big-O-Battle Coding Competition, LOGIN 2025 (PSG College of Technology) 2025

- Designed and implemented an autonomous game-playing bot to compete in a round-robin strategy tournament.
- Achieved first place based on algorithmic strategy, code efficiency, and competitive performance.

Open Source & Contributions

English–Tamil Translation Model (M2M100) – Hugging Face Release | PyTorch, Transformers 2025

- Fine-tuned Facebook's M2M100 (424M parameter) transformer model for English–Tamil neural machine translation.
- Built the full training pipeline using PyTorch and Hugging Face Transformers including preprocessing, tokenization, and evaluation.
- Released the fine-tuned model publicly on Hugging Face enabling open access for research and downstream NLP applications.

Gitsy – AI-Powered Git Assistant (VS Code Extension) | TypeScript, VS Code API, 2025

- Developed an AI-powered Git workflow assistant for VS Code that performs intelligent pre-flight checks before push, commit, and merge operations.
- Implemented secret detection, branch safety validation, and code-quality analysis using GitHub Copilot with Gemini fallback.
- Built an interactive sidebar dashboard for repository status, branch management, pull requests, and real-time Git operation logs.
- Integrated secure credential storage using VS Code Secret Storage and ensured all AI analysis runs locally without external data sharing.