GANESH SENRAYAN

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RESEARCH INTERESTS

Machine Learning, Deep Learning, Large Language Models, LLM Agents, Knowledge Graphs, Retrieval-Augmented Generation, Multi-Armed Bandits

EDUCATION

Indian Institute of Technology Madras, Chennai, India — Nov 2020 — May 2025
Integrated M.Tech. in Data Science & B.Tech. in Mechanical Engineering — Cumulative GPA: 8.67/10.0
Advisor: Prof. Balaraman Ravindran, DSAI Dept.

Mahatma Montessori School, Madurai, India — Jun 2019 — Apr 2020
Class XII (CBSE) — Percentage: 94.20%

Vikaasa School, Madurai, India — Jun 2017 — Apr 2018
Class X (ICSE) — Percentage: 94.33%

PUBLICATIONS

With Fujitsu Research

- Agarwal, A., **Senrayan G.,** and Devaguptapu, C. Hybrid Graphs for LLM-based Question Answering on Table-and-Text Sources. *(NAACL 2025 Main Track)*
- **Senrayan G.,** Moyuru Y., Jindal I., and Purohit K.,. Exploratory and Assimilating Reflection: Reflective Recall Cycle for Long-Term Memory *(ICML 2026 SCALE Workshop, Oral)*
- Shastry A.[*], **Senrayan G.,**[*] Satapara S.[*], Panda P., and Devaguptapu, C. Beyond Isolated Tasks: A Framework for Evaluating Coding Agents on Sequential Software Evolution *(ICML 2026 DL4Code Workshop, * - equal contribution)*

With Centre for Responsible AI & Google DeepMind

- Parthasarathy, A., Subramanian, C., **Senrayan G.,** Adappanavar, S., Ravindran, B., Taneja, A., and Tambe, M. Multilinguality in LLM-Designed Reward Functions for Restless Bandits: Effects on Task Performance and Fairness. *(Deployable AI Workshop, AAAI 2025).*

RESEARCH EXPERIENCE

Fujitsu Research — Bengaluru, India
AI Researcher — Jul 2025 — Present

- Improved memory architectures for agentic LLM systems to show increased recall on long-horizon chat tasks
- Built a dataset to evaluate effectiveness of LLM-powered coding agents on long horizon tasks
- Built an Emulation System - build an evaluation and training sandbox from scratch for Enterprise Systems. This is used to train and evaluate LLM-based agents on Enterprise Systems before deployment.

Centre for Responsible AI, IITM — Chennai, India
Student Researcher (Master's Thesis) — Aug 2024 — May 2025
Guides: Prof. Balaraman Ravindran and Dr. Chandrasekhar Subramanian

- Collaborating with **Google DeepMind (Prof. Milind Tambe and Dr. Aparna Taneja)** to work on using LLM-generated reward functions for Restless Multi-Armed Bandits (RMABs) with applications in public health
- Analyzed impact of multilingualism, complexity and phrasing of the prompts on performance & fairness of the algorithm
- Investigating scalable and deployable solutions for making the RMAB algorithm effective at the grassroots level

Fujitsu Research — Bengaluru, India
Research Intern — May 2024 — Aug 2024
Guides: Ankush Agarwal, Pranoy Panda and Chaitanya Devaguptapu

- Developed a novel Hybrid Graph-based approach for complex question answering using LLMs over table and text sources
- Achieved an increase in performance metrics such as Exact-Match by **9.5%,** F1 score by **8%**, reduction in token size & cost by **44%** over SoTA methods in Hybrid-QA and OTT-QA datasets
- Engineered Agentic Architecture for RAG using Knowledge Graphs and deployed a working demo using FastAPI, Next.js

ENGINEERING EXPERIENCE

Sarvam.ai Chennai, India
AI Engineer Intern Feb 2024 — Mar 2024

- Benchmarked the ability of more than 5 LLMs to call tools accurately on the Berkeley Function Calling Leaderboard
- Experimented with the ReAct framework of prompting and achieved a **2%** increase in the Overall Accuracy category
- Built a web-app PoC using Generative UI created by LLM Agents for booking flights through voice commands

Standard Chartered GBS Chennai, India
Software Development Engineer Intern May 2023 — Jul 2023

- Developed a Python pipeline to transliterate Alteryx XML files and generate equivalent Informatica XML files
- Deployed a directed graph to replicate ETL workflows, optimizing migration with graph traversal algorithms
- Automated the migration of more than **80** ETL workflows, reducing manual intervention by more than **165** man-hours

KEY PROJECTS

Generative Models for Clustering single-cell RNA-sequencing Data
Guide: Prof. Manikandan Narayanan

- Experimented with Variational Auto Encoders for clustering single-cell RNA sequencing data to identify novel cell types
- Implemented state-of-the-art papers such as scAce and scVGAE and performed a comparative study of the methods
- Proposed a novel solution combining Variational Auto Encoders and PhenoGraph, a graph-based clustering algorithm, achieving an increase in ARI by **2%**

Trustpilot Review Analysis
Guide: Dr. Sudharsun Sandhiappan

- Developed a 2-step data analytics pipeline for analysing trust pilot reviews and parallelized it using Apache Beam
- Used a simple RNN model for review sentiment prediction and orchestrated the entire pipeline using Airflow
- Served the model through FastAPI, containerized it using Docker and monitored iat through Prometheus and Grafana

Image Captioning
Guide: Prof. Chandra Sekhar C

- Built an Image Captioning module using CNN and NetVLAD as the encoder and LSTM as the decoder
- Trained the module on the COCO Captions dataset, achieving a BLEU-1 score of **0.74**, BLEU-4 score of **0.28**
- Implemented various state-of-the-art techniques such as Meshed-Memory Transformers, ExpansionNet, etc.

SELECTED COURSES

- Pattern Recognition and Machine Learning
- Fundamentals of Deep Learning
- Algorithmic Approaches in Computational Biology
- Reinforcement Learning
- Software Engineering
- Mathematical Foundations of Data Science

EXTRA-CURRICULAR ACTIVITIES

Hues of India Chennai, India
Volunteer Feb 2024 — May 2024

- Volunteered at Hues of India, an NGO dedicated to improving lives of students through therapeutic art sessions
- Built a mobile application using Next.js, Django and AWS to improve participant engagement by gamifying the process

InstiSpace Chennai, India
Project Member Dec 2022 — Apr 2023

- Developed InstiSpace, a mobile application for students of IIT Madras with more than 5k downloads in the Play Store
- Used a tech stack consisting of Flutter for the frontend, NestJS with GraphQL for the backend and AWS for deployment

Programming Club IITM Chennai, India
Co-ordinator Apr 2021 — May 2022

- Coordinated a Summer Coding Camp, leading sessions on Data Structures and Algorithms for more than 1,500 students
- Organized competitive programming contests including Reverse Coding, Code Golf, with more than 2,000 participants

SKILLS

- **Programming Languages:** Python, C++, JavaScript, TypeScript, Dart
- **Libraries and Packages:** Pytorch, Tensorflow, Langchain, Langgraph, Sci-kit learn, NumPy, Pandas, Next.js, FastAPI
- **Tools and Software:** Docker, Apache Beam, Airflow, Prometheus, LaTeX