

Madhav Aggarwal

 [Github](#) |  [LinkedIn](#) |  madhavaggarwal86@gmail.com |  +91-9056088149

Education

- **Rajiv Gandhi Institute of Petroleum Technology** 2022 - 2027
Integrated Dual Degree (B.Tech in Computer Science & M.Tech in AI)

Experience

- **MultiTV Tech Pvt. Ltd.** May 2025 - Oct 2025
AI Intern
 - Developed an automated **table tennis rally clip generation system** that extracted rally segments from full-length broadcast match feeds, generating clips from serve initiation till point completion.
 - Built a **computer vision pipeline** for **fashion attribute extraction** from movie/video frames, with fine-grained **apparel and accessory segmentation** to detect individual items (shoes, watches, caps, t-shirts, jeans, etc.) from paused video scenes.
 - Developed a **visual attribute recognition module** to extract clothing characteristics like **color, texture, pattern, and category** from detected items for product matching and retrieval for an OTT platform.
- **FSIL at Georgia Tech.** May 2024 - Oct 2024
Research Assistant
 - Initially started annotating a large dataset of credit agreements for NER task and proved that it is better than the rest of the other available datasets worldwide.
 - Fine-tuned a financial dataset across large language models (LLMs) to enhance performance in Named Entity Recognition (NER) tasks, achieving a **20% improvement** in accuracy compared to baseline measurements

Projects

- **Agentic RAG: Document Q&A System:**
 - Built an **agentic RAG** system using a **LangGraph Drafter-Compliance agent loop**, where the Compliance agent validates draft answers against retrieved chunks and triggers revisions before returning a response.
 - Built a hybrid retrieval pipeline combining **BM25** and **ChromaDB** vector search via **Reciprocal Rank Fusion (RRF)**, with a layout-aware ingestion pipeline preserving section metadata for precise citations.
- **Smash-X - AI-Driven Badminton Analytics System:**
 - Built **Smash-X**, a 4-module badminton analytics system combining **computer vision, pose estimation**, and a **Vision-Language Model** for explainable AI coaching feedback.
 - Built a match analysis pipeline (**YOLOv5 + ByteTrack** + homography court mapping) feeding **Gemini**-generated coaching reports, and a **MediaPipe**-based exercise module achieving 55 FPS at 94-100% rep-detection accuracy.
- **SudokuVision: Real-Time Sudoku Recognition & Solving System:**
 - Developed a real-time Sudoku solving pipeline using **OpenCV**, contour detection, OCR, and constraint-based algorithms on live camera feeds, with **robust perspective transformation** to isolate grids under blur, shadows, and varying brightness.
 - Engineered an image preprocessing pipeline (adaptive thresholding, denoising, sharpening) to improve **OCR-based digit recognition** accuracy, enabling end-to-end real-time inference with overlay visualization.

Publications

- M. Aggarwal, S. K. Mishra, "A Multi-Tier Collaborative Memory Architecture for Multi-User LLM Agents using Temporal Semantic Graphs", Manuscript in preparation: Target NeurIPS 2026

Achievements

- **LeetCode - Knight**, Maximum Rating: **1979 - Top 2.9%** globally. [Profile Link](#)
- **CodeChef - 3 Star**, Maximum Rating: **1602** [Profile Link](#)
- Secured **AIR 3232** in **GATE CS 2026 (Top 1.6%)** and **AIR 1718** in **GATE DA 2026 (Top 2.5%)**.
- **IEEE Hackathon Winner**: 3rd place in the **AI Voice Cloning Challenge** (IEEE RGIPT), solving Prodigal AI's zero-shot voice cloning problem statement.
- **SAS Global Hackathon Finalist**: Selected among the **top 100 teams worldwide** in the SAS International Hackathon.

Skills

- **Programming Languages**: Python, C, C++, Matlab, SQL
- **Libraries & Frameworks**: PyTorch, TensorFlow, Keras, CUDA, Scikit-learn, OpenCV, Hugging Face, LangChain, LangGraph, Librosa, NumPy, Pandas, Matplotlib, Seaborn, MongoDB, PostgreSQL
- **MLOps & Deployment**: MLflow, DVC, Apache Airflow, Docker, FastAPI, Flask, Weights & Biases (WandB), ChromaDB, Pinecone, Azure, AWS, Git, Linux, Postman, Raspberry Pi, Ollama, llama.cpp