

# SAMARTH K J

[Email](#) | [LinkedIn](#) | [Github](#)

## EDUCATION

Indian Institute of Technology, Madras

BTech, Civil Engineering, CGPA: **8.86**

Jun, 2026

Kendriya Vidyalaya, Malleshwaram

Grade 12, Percentage: **95.2**

May, 2022

Grade 10, Percentage: **96.0**

May, 2020

## SCHOLASTIC ACHIEVEMENTS

- Secured **99.46%** ile in **JEE(M)** among 1M+ students
- Achieved **AIR 1473** in **KVPY** among 50K+ students
- Secured **AIR 5957** in **JEE(A)** among 150K+ students
- Scored **324/390** in **BITSAT**, was offered BE in CS at BITS Pilani

## RELEVANT COURSEWORK

- Deep Learning
- DL in Speech\*
- Convex Optimization\*
- Differential Equations
- ML Foundations
- Linear Optimization
- Probability & Statistics
- Series and Matrices

\*Ongoing

## EXPERIENCE

Massachusetts Institute of Technology | Student Researcher

Jan 2025 – May 2025

- Built an **agentic system** to aid **memory** with **AI**; submitted to the **flagship conference ACM CHI 2026**.
- Built a **novel data pipeline** on Python FastAPI server **reducing the latency by 80%** using concurrency.
- Evaluated transcripts with **WER and CER**, achieved **4.53% and 1.54%**. Used **LLMs** to flag unsafe outputs.

Fractal AI Research | AI Research Intern

May 2025 – Aug 2025

- **Led the development** of **reward models** to align **diffusion image models** with human visual preferences.
- Finetuned **SigLIP2** using **DeepSpeed ZeRO** with a **novel aesthetics-based dataset** for reward modelling.
- Orchastrated **cross-attn** and **CFG-based guidance methods** to improve image fidelity of DiTs by  $\approx 10\%$ .
- **Curated OCR data** to finetune DiT using **Florence-2** with **GRPO**; increased text-gen accuracy by **24.5%**.

Dirac Labs | ML Associate

Feb 2024 – Dec 2024

- Implemented a **SciML-based NN** in the Julia language for real-time edge applications at **<5ms inference rate**.
- Strategised a data pipeline on **Google Cloud** for the pre-processing, transformation & storage for **>5TB** of data.
- Built an **RF model** to detect soil type using **hyperspectral satellite imagery** with an **accuracy of 95.7%**.

## PROJECTS

Efficient Tamil ASR with LoRA | *PyTorch, Transformers, PEFT, KenLM*

Aug 2025

- **LoRA-tuned** IndicWav2Vec (a **317M** params model) on **201-hrs** of Tamil speech, yielding a **13.45% WER**.
- Cut trainable parameters by **99%+** and model storage by **99.3% (1.2 GB to 8 MB)**, enabling scalable ASR.
- Used a **5-gram** Tamil KenLM with beam search, **boosting accuracy by 2.3%** over a greedy-decoding baseline.

StrInt: Structural Intelligence | *LangGraph, LangChain, Streamlit, ragas, FlagEmbedding* Aug 2025 – Present

- Built an **agentic AI system**, using **LangGraph & Gemini API** to design structures acc. to Indian Standards.
- Improved context relevance by **23.4%** via **reranking, smart-chunking** & extracting with **MLLM-based OCR**.
- Achieved **0.96 faithfulness, 0.92 answer relevancy** and **0.79 context relevancy** with **ragas** evaluation.

Product Price Prediction | *Python, PyTorch, Transformers, PEFT, Pandas, Scikit-learn*

Oct 2025

- Developed a pricing model to predict product prices from their descriptions; **ranked 109 out of 25K+ teams**.
- **Fine-tuned DeBERTa-v3-Large (304M)** using **LoRAs**, outperforming LLM based models of 4B+ parameters.
- Implemented a **custom regression head** and trained **10 epochs** for **6 h** on **RTX 3060** after optimizations.

Earthquake Response Spectrum Prediction | *PyTorch, Pandas, Matplotlib*

Jan 2024 – May 2024

- Built **GenAI models** like **CGAN & VAE** to predict Structural Impact of Earthquakes using 6 EQ params.
- Implemented a **novel-loss** function for **CGAN** in PyTorch. Improved the test-data **R<sup>2</sup>** value to a SoTA **0.91**.
- Used XGBoost, FFNNs and BNNs to predict ground acceleration values to get **R<sup>2</sup> values of 0.82, 0.84 & 0.87**.

## COMPETITIONS

- Secured **1st place** in Buildathon; used **Flutter** to create **OCR & SQLite** based data digitization application.
- **Headed a 5-member team & devised strategy** to bag **1st place** in Mock Auction among **345** participants.
- Devised innovative AI solutions to win **3rd place pan-India** in **L&T Smart City Challenge** among **180+** teams.

## POSITIONS OF RESPONSIBILITY

Professional Shows, Saarang | Deputy Coordinator

Jun 2023 – Apr 2024

- Managed the main event with **80k+** footfall including artists like **Farhan Akhtar and Matisse & Sadko**.
- Spearheaded the publicity and sales for the online degree section of IIT Madras, comprising of **68K+** students.
- **Managed a 6-member Malaysian band** and corresponded with various funding agencies for cultural grants.

Corporate Relations: E-Cell | Assistant Manager

Dec 2022 – Mar 2023

- Solely responsible for negotiating a deal in kind worth **INR 2.5L** from **Kokuyo Camlin Ltd.** for the E-Summit.
- Managed the **branding and advertisement** of sponsors during E-Summit and **chaperoned VIP delegates**.