Vrishab Anurag Venkataraghavan

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Education

Indian Institute of Technology Madras	**Chennai**
B.Tech. in AI & Data Analytics, CGPA: 9.02/10	*2024 – 2028*
MVM Senior Secondary School (CBSE)	**Chennai**
Secondary School Leaving Certificate, Percentage: 96.4/100	*2024*

Achievements

○ **Joint Entrance Exam Mains 2024:** Achieved All India Rank **111** (**99.997** Percentile)
○ **Joint Entrance Exam Advanced 2024:** Achieved All India Rank **184**
○ **Olympiads (Sciences):** Ranked in the 99th percentile nationally in NSEP (Physics) and NSEC (Chemistry)
○ Qualified for and Participated in **INPhO** and **INChO**, and qualified for the **RMO** (Regional Mathematics Olympiad)
○ **Hackathon:** Ranked Second Overall in Department-wide Computational Chemistry ML Hackathon

Technical Projects

Dec 2025

Satellite Imagery Analysis Interface (Inter IIT 2025)   *Computer Vision | NLP | Multimodal AI*
○ Developed a Natural Language Interface for satellite imagery focusing on Captioning, Grounding, and VQA
○ Evaluated Vision Encoders and VLMs (**LLaVA, GeoChat, Kimi**) for granular object detection and QA
○ Implemented text-based segmentation using **Text4Seg** and integrated fallback mechanisms with **SAM3**

Nov 2025

ML Algorithms & Optimization Benchmarking (Course Project)   *Optimization | Machine Learning*
○ Implemented **Linear Regression** variants from scratch: SGD, ADMM, Adam, Stochastic Quasi-Newton, Subsampled Hessian-Free
○ Built classifiers from scratch (**Random Forest, XGBoost, K-Means**) and ensembles (KNN+PCA, Soft Voting) for **MNIST** data
○ Conducted rigorous benchmarking and hyperparameter tuning to evaluate convergence, time-complexity, and accuracy

Oct 2025

Data Visualization of Indian 2024 Elections   *Data Analytics | Visualization*
○ Developed an interactive **web-based dashboard** to analyze 2024 Lok Sabha results across 543 constituencies
○ Visualized voter turnout, victory margins, and gender-based participation using **Plotly** and **Dash** heatmaps

Sep 2025

Clinical Multi-Agent Diagnosis System   *AIML | NLP*
○ Built a multi-agent **clinical decision RAG system** (Clinical QA, Triage, Diagnosis Agents) to analyze patient records
○ Implemented hybrid search using **BM25Okapi** and **FAISS** with cross-encoder re-ranking
○ Utilized **custom fine-tuning (DAPT)** of a BERT-based model for medical domain accuracy

Jul 2025

Unsupervised Anomaly Detection via Knowledge Distillation   *Computer Vision | Anomaly Detection*
○ Engineered an unsupervised industrial anomaly detection model trained on the **MVTec-AD Dataset**
○ Implemented **knowledge distillation**; training a U-Net student to mimic multi-scale features of a pre-trained **DINO ViT**

Apr 2025

CO_2 Solubility Prediction Model for Carbon Capture   *Machine Learning | Computational Chemistry*
○ Developed a model to predict CO_2 solubility in liquids for **Carbon Capture Technology** (Comp. Chem Hackathon)
○ Extracted molecular fingerprints from **SMILES** data and experimented with ML models to predict solubility

Technical Skills and Relevant Coursework

○ **Relevant Coursework:** Programming & Data Structures, Probability & Statistics, Optimization, Computational Methods for Data Science, Computational Physics/Biology/Chemistry, Data Curation & Visualization, ML, Algorithms for DS, AI
○ **Languages, Libraries & Tools:** Python (PyTorch, NumPy, Pandas, Matplotlib, Plotly, BeautifulSoup, Pwntools), C++, SQL

Positions of Responsibility

Member, Inter IIT AI Contingent (ISRO Problem Statement)	*Nov 2025-Dec 2025*
Coordinator, IITM Cybersecurity Club	*Jul 2025-Jun 2026*

Member of the team which achieved:
○ **Google CTF 2025** - 1st rank in India, global top-50
○ **GPN CTF 2025** - 1st rank in India, global top-25
○ **bi0sCTF 2025** - 40th rank worldwide

Extracurriculars

○ **Quizzing:** Member of **IITM Quiz Contingent**; member of winning contingent in Nihilanth 2025 (inter IIT-IIM quiz)
○ **Speedcubing:** Official average of **8.24 seconds** on the 3x3 Rubik's Cube
○ **Cultural:** Vocalist/Guitarist in **IITM Music Contingent**; representing institute in Inter-IIT Cultural Meets