T VamsiKrishna Yadav | **25M2125**
Computer Science & Engineering | **MS by Research**
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Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	-	9.0
Graduation	IISER Bhopal	IISER Bhopal	2024	8.51
Graduation Specialization: **Electrical Engineering and Computer Science**				
Intermediate	Andhra Pradesh State Board	Narayana Junior College	2019	9.82
Matriculation	Andhra Pradesh State Board	Narayana E.M. School	2017	9.8

AREA OF INTEREST

• Machine Learning • Deep Learning • Natural Language Processing • Explainable AI • Model Interpretability

MS R&D Project-1

Interpretability in Large Language Models *(Aug 2025 – Present)*
R&D Project-1 | *Guide:* ***Prof. Virendra Singh***

- Reviewed recent interpretability and multimodality works (*Rethinking Interpretability in the Era of LLMs*; *Single-to-Mix Modality Alignment*; *Transformers Need Glasses*).
- Built a binary counting benchmark and trained **1- and 2-layer** decoder-only transformers; observed strong short-length accuracy but steep decline as length grows (e.g., 1L: ∼95% at 10–30 tokens, ∼41–53% by 120–139; 2L: ∼99% near 30, $<$ 50% by 120).
- Fine-tuned **GPT-2** and **Llama 3.2 3B** on the same benchmark; **Llama 3.2 3B** performed best across length bins, surpassing GPT-2 (86% aggregate accuracy).
- Planned interpretability analysis to probe attention, hidden states, and counting circuits using tools such as TransformerLens and logit lens, targeting failure regime diagnosis and mechanism discovery.

PROJECTS

A Comparative Study of POS Tagging Models | *Course Project* *(Aug 2025)*

- Implemented and compared **HMM, RNN-based Encoder-Decoder, and LLM** approaches for POS tagging.
- Evaluated models using **accuracy, precision, recall, F1-score**, and analyzed results with confusion matrices.
- Gained practical experience in **NLP, sequence modeling, and model evaluation** using the Brown corpus (NLTK).

Comparative Study of Neural Models for Hindi Transliteration | *Course Project* *(Oct 2025)*

- Developed and benchmarked **LSTM** (1-, 2-layer) and **Transformer** (1-, 2-layer, multi-config) models for Hindi–Roman to Devanagari transliteration using the AI4Bharat Aksharantar dataset (**100k samples**).
- Designed balanced data sampling strategies and curriculum-aware splits to improve character coverage and generalization across length bins.
- Achieved best classical model scores with **2-layer LSTM**: **36.3%** word accuracy, **86.2%** char F1; and competitive **2-layer Transformer**: **36.7%** word accuracy, **69.0%** char F1.
- Evaluated open-source LLM (**Qwen3-next-80b**), reporting up to **47.6%** word accuracy, **88.8%** char F1; analyzed greedy vs. beam decoding results for technical insights.

Generative AI For Next-Generation Autonomous Vehicles | *BS Project* *(Jan 2024 - Apr 2024)*

- Implemented **ANN/CNN** baselines for image classification and leveraged pre-trained **YOLOv5** and **U-Net** for detection/segmentation in AV perception tasks.
- Explored **Generative AI** techniques (**Autoencoders**, **GANs**) and reviewed literature (***GAIA-1***) to simulate diverse driving scenarios and enhance data generation for robust AV training.
- Outlined how pre-trained vision models and generative data could improve object recognition, scene understanding, and rare-scenario coverage in AV pipelines.

From NLTK to RoBERTa: Sentiment Analysis of Amazon Reviews | *Course Project (March 2024 - Apr 2024)*

- Developed sentiment analysis models using **VADER (NLTK)** and **RoBERTa (Hugging Face)** on Amazon reviews.
- Fine-tuned transformer models and utilized Hugging Face **pipeline API** for efficient inference.
- Conducted a **comparative evaluation** highlighting trade-offs between rule-based and deep learning methods.

SELF PROJECTS

Evidence Retrieval and NLI Classification using Transformers

- Built an end-to-end pipeline for **claim verification** on the FEVER dataset, indexing over 5 million Wikipedia passages.
- Integrated **FAISS-based retrieval** with **Transformer-based sequence classification** (BERT).
- Fine-tuned models for 3-class NLI (*Supports, Refutes, Not Enough Info*) and evaluated using **accuracy, recall, and F1-score**.
- Gained practical experience in **retrieval-augmented NLP, fact verification, and large-scale model training**.

Handwritten Document to LaTeX Converter

- Developed an end-to-end **OCR pipeline** to digitize handwritten mathematical documents into LaTeX and PDF.
- Implemented **CRAFT** for segmentation, fine-tuned **TrOCR** for text recognition, and adapted **Im2LaTeX / Nougat-for-formula** for equations, achieving BLEU score **0.81** and CER **0.22**.

INTERNSHIPS

Off-Road Navigation (OFFSEG Implementation) | *Summer Internship* *(May 2023 - Jul 2023)*

- Implemented a research paper titled **OFFSEG**, applying deep learning techniques for off-road terrain segmentation.
- Conducted **literature review** on GA-Nav and CAMEL for benchmarking.
- Gained hands-on experience in **computer vision, deep learning models, and their real-world applications** in autonomous navigation.

RELEVANT COURSEWORK

Relevant Courses	Foundations of Machine Learning, Deep Learning for NLP, Software Lab.

TECHNICAL SKILLS

Programming Languages	C, C++, Python | Familiar with Bash
Development	HTML, Markdown, CSS, SQL
Tools and Frameworks	Git, VS Code, PyTorch, TensorFlow, Keras, scikit-learn, Numpy, Pandas

POSITIONS OF RESPONSIBILITY

Technical Secretary, Hostel 18 Council, IIT Bombay *(Aug 2025 – Present)*

- Planned and managed technical activities, organizing workshops, hackathons, and competitions while coordinating with institute bodies for resources.

SCHOLASTIC ACHIEVEMENTS

- Secured **99.04 percentile** in **GATE** Computer Science & Information Technology amongst **124k** candidates. *(2024)*
- Secured **95.23 percentile** in **GATE** Data Science & Artificial Intelligence amongst **39k** candidates. *(2024)*
- Secured **All India Rank (AIR) 30254** and **OBC-NCL rank 7505** in **JEE (Advanced)**. *(2020)*
- Secured **94.758 percentile** in **JEE (Main)**. *(2020)*
- Secured a rank of **4105** in the Andhra Pradesh **EAMCET**. *(2020)*
- Ranked among the **Top 10%** of scorers in the school-level **Indian National Mathematics Olympiad (INMO)**. *(2016)*

EXTRA-CURRICULARACTIVITIES

Interests and hobbies: Team sports (Kabaddi, Volleyball), Traveling to explore new places, and Strength & Fitness Workouts.