Ojasva Nema

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Education

Indian Institute of Technology Roorkee — Roorkee , India
B.Tech Metallurgical and materials engineering | CGPA: 8.62 — 2023-2027

Rankers' International School — Indore, India
Senior Secondary, Class XII: 92% — 2023

Kendriya Vidyalaya No.1, Indore — Indore, India
Senior Secondary, Class X: 98.2% — 2021

Publications

Image-Alchemy: Advancing Subject Fidelity in Personalized Text-to-Image Generation
ICLR DeLTa workshop 2025 — 2025

- Developed a pipeline to personalize Stable Diffusion XL with high-fidelity novel subject integration.
- Mitigated overfitting and forgetting using tailored fine-tuning and regularization strategies.
- Applied LoRA training with segmentation-guided Img2Img for realistic and seamless subject blending.

Domain Circuit Discovery in LLMs - Mechanistic Interpretability
Preprint — 2025

- Investigated how LLMs internally represent and process diverse domain knowledge.
- Pinpointed component roles using probing, adaptation analysis, and causal swaps.
- Found attention routes domain identity while MLPs store domain-specific logic.
- Submitted to **ICLR 2026 main conference.**
- Please find more details on Our website

Experiences

Research Assistant
Prof. Parikshit Pareek , Electrical Department , IIT Roorkee — Ongoing

- Designed a sparsity-aware VAE for modeling ultra-sparse data (0.2% active pixels).
- Introduced a weighted loss to stabilize training, reduce artifacts, and preserve detector features.
- Built a physics-informed generative framework reproducing realistic detector sparsity.
- Extending to sparse power flow datasets to demonstrate model generalizability.
- Targeted submission to **ICML 2026**

AI Engineer
Elimentary , Banglore — 2025

- Built local LLM inference APIs exposing layer-wise probabilities, quantization controls, and secure access.
- Optimized GPU batching and throughput by implementing Sequence Scheduling for concurrent LLM requests.
- Designed LLM evaluation pipeline and datasets and built a no-code evaluation platform with observability via Langfuse and Grafana, enabling non-technical testing and analysis.

Projects

Are Bilinear transformers more interpretable?
Data Science Group , IITR — Ongoing

- Bilinear MLPs have proved to be more interpretable than ReLU MLPs , especially on arithmetic tasks.
- We aim to train LLMs on arithmetic tasks and observe if they are able to learn addition/subtraction etc.

Achievements

- Amazon ML challenge(2025) - Ranked 66th out of 82,789 participants in a national ML competition.
- JEE Mains(2023, Govt. of India)-Among the top 1.8% of 1.2 million+ aspirants nationwide.
- JEE Advanced (2023 , Govt. of India) - Ranked 7282, among 100,000+ of India's top-performing candidates.

Areas of interest

- Mechanistic Interpretability, Deep generative models, Large Language Models

Additional information and co-curriculars

- **Student Clubs** - Member at Data Science Group , IIT Roorkee
- **Languages** - Hindi(Native) , English(Advanced)