Nayan Kumar

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Education

Indian Institute of Technology, (IIT ISM) Dhanbad — Expected May 2028
Integrated Master of Technology in Mathematics & Computing — ***GPA: 8.87/10***

Publications

GRIM — **Project Website** | **arXiv Paper**
*Shailesh, Alok Raj, **Nayan Kumar**, Priya Shukla, Andrew Melnik, Michael Beetz, Gora Chand Nandi*
AAAI'26 (Oral).

Experience

Center for Intelligent Robotics, IIIT Allahabad — Mar 2025 – Sep 2025
***Research Intern** : Supervised by Prof. G.C. Nandi & Prof. Andrew Melnik*

- Co-authored the **GRIM** paper, setting new state-of-the-art on TaskGrasp (**0.67** AP) with strong generalization to unseen objects (**0.65** AP) and tasks (**0.64** AP).
- Designed a perception pipeline that fused multi-view images into a feature-rich 3D point cloud using distilled DINOv2 features.
- Built baseline models, benchmarking harness, and validated the framework on a **Kinova Gen3 lite** robotic arm through real-world trials.

Projects

Amazon ML Challenge 2025: Smart Product Pricing — Oct 2025 – Nov 2025
Amazon ML Challenge 2025

- Benchmarked a **multimodal pipeline** (XGBoost + ViT/CNN) at **50.05% SMAPE**, identifying **text features** as the dominant signal.
- Migrated to a **text-centric LightGBM** model, tuning **S-BERT vs. TF-IDF** embeddings and vocabulary size.
- Achieved **46.03% SMAPE** using **20k TF-IDF features**, outperforming deep learning ensembles.

Mini-GPT: Generative Transformer from Scratch — Jul 2025 – Aug 2025
Personal Project

- Built a **6-layer Transformer** (∼10M params) with **multi-head self-attention**, masking, and **positional embeddings** (256-token context).
- Demonstrated clear gains over a **Bigram baseline**, evolving outputs from random text to coherent, structured dialogue.
- Stabilized training using **residual connections, layer normalization, and dropout**, achieving reliable convergence on Tiny Shakespeare.

Skills

Languages: Python, C, C++

Domains: Machine Learning, Deep Learning, Computer Vision, ROS (Basics)

Frameworks & Libraries: PyTorch, OpenCV, NumPy, Pandas, Matplotlib

Developer Tools: Git, Linux, GitHub, VS Code

Relevant Coursework: Data Structures & Algorithms, Operating Systems, Linear Algebra, Computer Organization & Architecture, Probability & Statistics, Statistical Inference

Achievements

- Placed in the **top 2% teams** at the **Amazon ML Challenge 2025**. *Mar 2025*
- Finished in the **top 3.3%** at **CodeFest'25**, a national ICPC-style programming contest. *Mar 2025*
- Secured **3rd place** at **HackFest**, a **36-hour hackathon** conducted by **IIT (ISM) Dhanbad**. *Feb 2025*
- Achieved a peak **CodeChef rating of 1700** (nayanparashar1). *Present*
- Reached a peak **Codeforces rating of 1560** (nayan_2207). *Present*

Leadership & Engagement

- **Member, RoboISM** (Robotics & AI Club, IIT (ISM) Dhanbad) – actively contributed to collaborative robotics projects within a 100+ member community.
- **Event Coordinator, Robowars @ Concetto'24** – organized multi-round competitions, managing logistics for 10+ teams.
- **Senior Mentor, JH-SIC Hackathon (NVCTI)** – guided teams through a 3-day sprint to develop functional prototypes.