Varnan Rathod

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Education

Shri Ramdeobaba College of Engineering and Management — Nagpur, MH
B.Tech. in Computer Science and Engineering (Honors in AI/ML): 9.25 CGPA — *Aug 2023 – May 2027*

School of Scholars, Wanadongri — Nagpur, MH
HSC: 92% — *Jul 2021 – May 2023*

Technical Skills

Languages: Python, Java, Javascript, SQL, C
Frameworks: TensorFlow, Keras, PyTorch
Developer Tools: Git, GitHub, Jupyter Notebook, VS Code, LaTeX
Libraries: NumPy, Pandas, Seaborn, Matplotlib, Scikit-Learn, SciPy, XGBoost, SHAP
Databases: MySQL, MongoDB, LanceDB

Research Experience

Research Intern — Dec 2025 – Apr 2026
Visvesvaraya National Institute of Technology (VNIT) — *Nagpur, MH (part time)*

- Selected under Dr. Praveen Kumar to design and optimize high-efficiency vision models for large-scale live video face detection.

Undergraduate Researcher — Aug 2025 – Oct 2025
Ramdeobaba University — *Nagpur, MH (part time)*

Mentor: *Dr. Khushboo Khurana*

- Conducted a comparative study of Transformer-based object detection models, including DiffusionDet and DEIM.
- Analyzed architectural trade-offs and scene understanding mechanisms in DETR-style detectors.
- Used a curated dataset for a particular use case and benchmarked models using mAP across various object scales and confidence thresholds.
- Fine-tuned selected models, achieving state-of-the-art (SOTA) bounding box detection results on the dataset.
- Authored a research manuscript based on the findings; currently under review at an international conference.

Research & Development Intern — May 2025 – Feb 2026
Ramdeobaba University — *Nagpur, MH (Part-time)*

Project: *Development of Coal Quality Exploration Technique using CNNs and Hyperspectral Imaging*
Sponsored by: *Ministry of Coal, Government of India*
Guide: *Principal & Prof. M. B. Chandak* | ***Coordinator:*** *Dr. Abhijeet Raipurkar*

- Implemented a CNN-based regression pipeline for coal quality assessment using hyperspectral image datacubes.
- Constructed and preprocessed a novel hyperspectral dataset acquired from a newly commissioned imaging sensor.
- Analyzed latent correlations across spectral bands to inform model adaptation and optimization.
- Fine-tuned a pretrained CNN architecture on a dataset approximately 3% the size of the original training corpus.
- Achieved a 72% reduction in MAE relative to baseline.

Relevant Courses

- **CATH 6100:** Generative Adversarial Networks (ongoing)
- **CATH 5100:** AI for Vision and Navigation
- **CATH 4100:** Distributed Computing Frameworks
- **CATH 3100:** Computational Statistics For Data Science
- **CST 6003:** Machine Learning (ongoing)
- **CST 5003:** Artificial Intelligence
- **CST 4001:** Design and Analysis of Algorithms
- **CST 3001:** Data Structures

- **MAT 4001:** Linear Algebra
- **MAT 3001:** Probability and Statistics
- **MAT 2001:** Discrete Mathematics
- **MAT 1001:** Calculus

Achievements & Roles

* **Finalist:** Datathon, ARTIMAS'25, PCCOE Pune
* **Grand Finalist:** Smart India Hackathon (SIH) 2024
* **LeetCode Rating:** 1566 (460+ problems solved)
* **CodeChef Rating:** 1496 (2, 700+ problems solved)
* **Executive Tech Member** — GFG RBU Chapter
* **Academic Mentor (2024-2025 & 2025-2026)** — RBU
* **Web Development Member** — Technical Club, RBU
* **City Rank 2:** CSIR NEERI Science Quiz 2023

Tests & Scores

* **JEE Advanced:** Secured an All India Rank (AIR) of **22704**
* **JEE Main (B.Tech):** Achieved a percentile of **95.72%ile**
* **JEE Main (B.Arch):** Attained **99.43%ile** with an All India Rank (AIR) of **362**
* **MHT-CET:** Secured a percentile of **98.77%ile**
* **Bebras Computing Challenge 2022**: Ranked **9th** nationally out of 6,369 participants