Nilesh Sarkar

Undergraduate Researcher (B.Tech) — Machine Learning & AI Systems

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Profile

I study how language models compress and preserve linguistic structure under extreme capacity constraints, combining mechanistic interpretability with deployment-driven model compression for low-resource Indic languages and edge devices.

Third-year undergraduate (B.Tech) in Artificial Intelligence and Robotics with strong interests in large language models, representation learning, robotics perception, and real-world AI systems.

Research Experience

AI Research Intern — Moog Controls (Moog India Technology Centre) Jun 2025 – Present
Applied AI Research Intern

- Developing AI-driven, safety-critical systems using retrieval-augmented generation (RAG) for engineering workflows.
- Improved retrieval accuracy from 70% to 80%+ using optimized retrievers and evaluation pipelines.
- Built LLM-powered CAD automation and engineering analysis tools for industrial workflows.
- Worked on reliability, traceability, and deployment of LLM-based systems in regulated environments.

Large Language Model Architecture & Compression Research 2024 – Present

- Studying transformer efficiency, information bottlenecks, and representation robustness.
- Exploring pruning, quantization, and low-rank adaptation for deployment-constrained settings.

Computer Vision Research — Autonomous Drone Navigation Sep 2025 – Present

- Researching vision-based navigation for all-terrain autonomous drones.
- Designing perception pipelines for obstacle avoidance and depth-aware navigation.

Humanoid Robotics Research Assistant Jun 2025 – Present

- Working on robotic humanoid prosthetic arm design and control.
- Developing perception-driven control pipelines and hardware-in-the-loop testing.

Professional Development and Leadership

Co-Founder and Lead — RoboVerse Club Nov 2024 – Present
Founded a 100+ member technical club; organized 30+ workshops and AI/robotics events.

Executive Committee Member — IEEE RAS & CIS May 2024 – Present
Organized 5+ technical events and student research activities.

Software Development Intern — Humans Care Foundation Jul 2024 – Aug 2024
Developed 24+ automation tools and NLP chatbots supporting NGO operations.

Projects

Prompt-to-CAD Generation System
Designed a system that converts natural language prompts into parametric CAD models using LLMs and rule-based geometry reasoning.

Education

Dayananda Sagar University, Bangalore Aug 2023 – Present
Bachelor of Technology (B.Tech) in Artificial Intelligence and Robotics

Technical Skills

Programming: Python, C++, C
AI & ML: PyTorch, TensorFlow, scikit-learn, CNNs, Transformers, LLMs, Reinforcement Learning
Computer Vision: OpenCV, SLAM, Object Detection, Image Generation
Robotics: ROS 2, Gazebo, Raspberry Pi, Arduino, LIDAR, IMU, FPGA
Platforms: Google Cloud Platform, Azure AI, NVIDIA AI Platforms
Tools: Git, GitHub, Docker, Jupyter, MATLAB, Google Colab
Project Management: Jira

Awards and Certifications

Exceptional Volunteering & Community Service Award — IEEE RAS & CIS (2025)
Machine Learning Certification — Kaggle (Jan 2025)
RapidMiner Certified Professional — Oct 2024