

SAPTARSHI MUKHERJEE

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EDUCATION

Swami Vivekananda Institute of Science and Technology

Kolkata, India

Bachelor of Technology (B. Tech) in Computer Science and Engineering

Expected July 2027

GPA: 7.5/10.0

Relevant Coursework: Machine Learning, Deep Learning, Computer Vision, Artificial Intelligence, Probability & Statistics

RESEARCH INTERESTS

Robust AI, Multimodal Learning, VLMs, LLMs, Model Failure Analysis

RESEARCH EXPERIENCE

Undergraduate Researcher – Machine Learning & Computer Vision

Jun 2024 – Present

- Studied robustness of deep vision models; observed ~85% accuracy drop under severe noise
- Built controlled evaluation pipeline for noise, blur, and low-light conditions
- Developed denoising autoencoder, reducing reconstruction error (MSE: 0.12 $\rightarrow$ 0.032)
- Explored multimodal systems and deepfake detection with robustness analysis

RESEARCH PROJECTS

Noise-Induced Hallucination in Vision-Language Models (VLMs) | [GitHub](#)

Mar 2026

- Studied impact of visual noise (Gaussian, blur, low-light) on caption correctness
- Analyzed perception-to-language error propagation using CLIP similarity and caption metrics
- Evaluated semantic drift across varying noise levels

Memorization vs Generalization in Vision-Language Models (VLMs) | [GitHub](#)

Mar 2026

- Investigated whether VLMs learn compositional understanding or memorized correlations
- Designed seen vs unseen composition benchmarks for evaluation
- Measured generalization gaps using similarity and retrieval-based analysis

Effect of Data Noise on Representation Learning in LLMs | [GitHub](#)

Mar 2026

- Studied impact of noisy training data (token corruption, grammar errors) on representations
- Analyzed embedding structures using small-scale transformer models
- Compared clean vs noisy training using perplexity and downstream performance

TECHNICAL SKILLS

- Programming:** Python
- ML/DL:** PyTorch, TensorFlow, Scikit-learn
- LLM & Multimodal AI:** Vision-Language Models, Prompt Engineering, Representation Learning
- Computer Vision:** OpenCV, Noise Modeling, FFT/DCT Analysis
- Data:** NumPy, Pandas, SciPy
- Tools:** Git, Jupyter Notebook, LaTeX

ACHIEVEMENTS / CERTIFICATIONS

- Best Class Representative Award
- Trained in Generative AI (LLMs, prompt engineering)

ACTIVITIES

- Participate in ML/CV research discussions and open-source contributions
- Implement and analyze research papers in robust and multimodal AI systems