

Nikhil Laxminarayana

GRADUATE STUDENT, ELECTRICAL ENGINEERING, IIT MADRAS

EDUCATION	Indian Institute of Technology Madras, Chennai, India <i>Master of Science, by Research, Electrical Engineering,</i> <i>Jul' 25 - Jul' 27 (Expected)</i> GPA: 8.67/10 (First Term)
	Indian Institute of Information Technology Kalyani, West Bengal, India <i>Bachelor of Technology, Electronics and Communication Engineering,</i> <i>Jul' 21 - Jul' 25</i> GPA: 9.45/10 (Overall), Rank 2

RESEARCH INTERESTS	Deep Learning, Diffusion Models, Optimisations Computer Vision, Image Processing, Problem Solving, Statistical Inference
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AWARDS & ACHIEVEMENTS	Awarded the HTRA Scholarship by the EE Deptt. at IIT Madras. Achieved Department Rank 2 in ECE at IIIT Kalyani. SIH 2024 Finalist representing IIIT Kalyani at IIT Gandhinagar . Founding Member of the IEEE Student Branch at IIIT Kalyani . Secretary of the inaugural edition of StatusCode0 , IIIT Kalyani's annual hackathon. Secretary of the Robotics Club at IIIT Kalyani . Management Lead of the Developers Student Club at IIIT Kalyani .
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RESEARCH PROJECTS	Throughput Maximisation in Cooperative Underlay Radios <i>Supervisor : Prof. Pratik Chakraborty</i> <i>Jan '23 - Aug '25</i> <ul style="list-style-type: none">- Analytically derived the joint secure-reliable outages under various CSI-availability regimes in cooperative cognitive underlay radio framework.- Analytical results for statistically optimal power allocation under the presence of an active eavesdropper were derived and tested against simulation results.- Upto 40% improvement in effective throughput with instantaneous power control as compared to statistically-optimal power control were observed.- Part of the work submitted as Bachelors Thesis at IIIT Kalyani, currently under review at TVT. Classifying Medical Images with Quantum SVMs and Hybrid Neural Networks <i>Independent Project</i> <i>May '23 - Aug '24</i> <ul style="list-style-type: none">- Developed a variational model for an SVM kernel, based on a unitary transform emulated by a quantum circuit.- Performed a comparative study of various vector encoding schemes.- The results outperform classical neural-network based architectures on the benchmark datasets by 10%. Throughput Improvements in Backscatter Systems under CSI-based Co-phasing <i>Supervisor : Prof. Shankar Prakriya, EE, IIT Delhi</i> <i>May '24 - Jul '24</i> <ul style="list-style-type: none">- Part of the work done during Summer Internship under Prof. Shankar Prakriya at IIT Delhi during Summer '24.- Studied the effective secrecy throughput of ambient backscatter systems under CSI knowledge based co-phasing to counter passive eavesdropper.
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ACADEMIC
PROJECTS

spack: A Simple Pipeline for Audio Classification using KAPre

Supervisor : Prof. Oishila Bandhopadhyay

Oct '24

- Developed a pipeline for training classifiers over a diverse dataset to classify instrument samples using frequency domain feature extraction with the help of [KAPre](#) for real-time Melspectrogram extraction with CNN-based feature extractors to classify audio samples.
- Devising solving strategies to reduce verification time on existing backends like CBMC

COURSE
PROJECTS

Comparison of various reward optimisation strategies in multi-armed bandits

Course : Probability | Supervisor : Prof. Venkatesh Ramaiyan

Oct '25 - Nov '25

- Compared algorithms like Explore-then-exploit, ϵ -greedy and UCB in a probabilistic reward in a multi-armed bandits setting.

ADDITIONAL
INFORMATION

Languages: C, C++, Python, Bash, Verilog, LaTeX, Assembly (x86, MIPS) MATLAB.

Courses at IITM: Applied Linear Algebra, Probability, Deep Learning for Imaging, Modern Computer Vision, Image Signal Processing.

Self Taught:

Hobbies: Table Tennis, Badminton, Football, Reading and Debating
