Pranay Meshram

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BS-Engineering Sciences
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Github
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Education

•Indian Institute of Science Education and Research, Bhopal *2023-Present*

BS in Electrical Engineering and Computer Science

Personal Projects

•Fine-Tuned LLAMA2 *Github Link*

Fine-Tuned Llama2 on Puffin Dataset for creative answers.

- Applied LoRA and **4-bit Quantization** to improve model efficiency while reducing memory consumption.
- Tools & technologies used: PyTorch, Google Colab, Transformers, PEFT, QLoRA.
- Configured BitsAndBytes for quantization .
- Modified the Custom dataset from Hugging Face to match the Llama2 prompt template.

•Occupancy Sensing from Thermal Images *Github Link*

Developed a real-time occupancy detection system using thermal imagery and edge deployment.

- Built a custom thermal image dataset using a Raspberry Pi with the **MLX90640** thermal camera.
- Preprocessed and annotated the data and trained a **YOLOv8**-based detection model.
- Applied data augmentation and quantized the model for lightweight deployment.
- Deployed and tested real-time inference on Raspberry Pi for in-building occupancy monitoring.

•Transformer from scratch *Github Link*

Built a Transformer model from scratch to understand the attention-based architectures.

- Implemented multi-head self-attention, positional encoding and encoder from scratch.
- Reconstructed the *"Attention Is All You Need"* paper by implementing its core concepts.
- Tools & technologies used: PyTorch, Google Colab.

•CNN based image classification on CIFAR 10 *Github Link*

A Convolutional Neural Network model to classify images from the CIFAR-10 dataset with 68 % accuracy.

- Performed data augmentation and optimization techniques.
- Tools & technologies used: NumPy, PyTorch and Colab.

•Smart Taxi using RL *Github Link*

*Built a reinforcement learning-based Smart Taxi system using **Q-Learning** .*

- Tools & technologies used: Python, OPENAI-GYM.
- Implemented **Q-Learning** algorithm to optimize taxi routes and minimize passenger wait times.

Technical Skills and Interests

Languages: Python, C, C++, Wolfram, Matlab
Developer Tools: VS Code, Google Colab, Jupyter Notebook, Mathematica, Matlab
Libraries: PyTorch, OpenCV, NumPy, Matplotlib, Pandas, Scikit-Learn, OpenAI gym
WebDev Tools: HTML, CSS
Tools: Excel, MS Powerpoint, Jupyter Notebook
Domains of Interest: Machine Learning, Computer Vision, Transformers, Generative Diffusion Models, Gen-AI
Coursework: Multivariable Calculus, Linear Algebra, Data Structures and Algorithms, Discrete Mathematics, Probability and Statistics, Signals and Systems, Econometrics, Introduction to C, Basic Electronics

Certifications

•NPTEL-Applied Linear Algebra for Signal Processing, Data Analytics and Machine Learning *Link*

•Machine Learning with Python by Great Learning *Link*

•Mathworks - Matlab Onramp *Link*

•Arduino Workshop *Link*

Positions of Responsibility

•Media Head - Computing and Networking Council, IISER BHOPAL *2024-2025*

•Core Committee - Electrical Engineering and Computer Science Club, IISER Bhopal *2024-2025*

Extracurricular

•Freelance Video Editor and Content Creator.