Saksham Gupta

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Education

Birla Institute of Technology and Science, Pilani October 2022 - May 2027 (Expected)
Bachelor of Engineering - Electrical Engineering, M.Sc Physics; GPA: 7.86 *Rajasthan, India*

- **Relevant Coursework:** Computer Programming, Math Methods in Physics

Work Experience

SAMEER (Society for Applied Microwave Electronics Engineering) *May 2024 - July 2024*
Research Intern *Under Dr. Poornima Srivastava, IMSD Department*

- Built a Multilayer Perceptron Neural network to calibrate Meteorological tower and SODAR instrument data, improving wind speed predictions across various heights and time frames.
- Implemented robust data cleaning techniques to address raw constraints, thereby optimizing the dataset for analysis.
- Experimented with various hyperparameters such as choice of optimizers and learning rates to mitigate overfitting, to achieve a RMSE of 0.87, down by 85 percent between calibrated and uncalibrated readings

Research Experience

Chest Tumor Detection using Diffusion Models *August 2024 - Present*
Academic Project *Under Prof. Vinay Chamola*

- Developed a Diffusion-based Classification Model for Chest Tumor detection using high-resolution medical datasets, outperforming conventional CNN-based models like ResNet-18, ResNet-50 and GoogleNet.
- Conducted Ablation studies which included analyzing the impact of linear and cosine scheduling along with the type of timestep embedding used, on loss and accuracy of the test dataset while experimenting with U-Net and multi-head attention architectures.
- Achieved a 95.63% accuracy,and an improved MSE loss of 0.027 compared to CNN models, significantly improving over conventional CNN-based approaches.

Projects

Binary Image Segmentation using U-Nets with Attention Blocks

- Performed image segmentation on a segmented nuclei dataset by leveraging U-Net architectures.
- Experimented with different activation functions and multi-head attention blocks, achieving optimized segmentation results which improved accuracy by 25%.

Diffusion Model from Scratch

- Trained a diffusion model from the ground up along by tuning multiple hyperparameters and analyzing feature maps.
- Conducted comparative studies on different diffusion architectures, refining overall model performance.

Movie Recommender System

- Implemented a recommendation system leveraging cosine similarity for improved movie matching.
- Utilized the IMDB dataset, analyzing parameters such as keywords, cast, and directors to enhance prediction accuracy.

Technical Skills

Languages: Python, C, C++
Technologies: PyTorch, TensorFlow, Pandas, Numpy, Sklearn, Keras, GIT
Concepts: Computer Vision, Deep Learning, Computational Physics