Ayush Naique

New York, USA | +1 (201) 234-2533 | ayushnaique@nyu.edu | linkedin.com/in/ayushnaique28 | github.com/ayushnaique

Education

Master of Science in Computer Science — **New York University** — *New York, NY, USA* — **09/2023 - 05/2025**

- (Courant Institute of Mathematical Sciences) Current GPA: 3.90 / 4.0
  Advanced Machine Learning, Computer Vision, Compiler Construction, Algorithms, Operating Systems

B.Tech in Computer Science and Engineering — **National Institute of Technology** — *Goa, India* — **08/2019 - 05/2023**

- Final GPA: 8.99 / 10

Skills

Languages: C++ | C | Python | JavaScript | OCaml | Scheme | Scala | Java | SQL | HTML | CSS
Technologies: Linux | Git | MongoDB | Docker | Kubernetes | AWS | Tensorflow | PyTorch | OpenMP | WebGL | SciPy | NumPy | Pandas
Practices: Data Structures | Algorithms | Object Oriented Programming | Deep Learning

Professional Experience

Graduate Researcher — **NYU Langone Health** — *New York, NY, USA* — **05/2024 - present**

- Conducting research on classification models for Scaphoid bone injuries utilizing X-Ray images.
- Creating end-to-end pipelines for deep learning models aimed at binary classification to predict the necessity of operative intervention for treatment decisions.
- **Tasks:** *Computer Vision, Classification, Image processing* | **Skills:** *Python, PyTorch, Computer Vision*

Undergraduate Researcher — **National Institute of Technology** — *Goa, India* — **09/2022 - 05/2023**

- Engineered sophisticated speech classification algorithms in Python for correct classification of Indian dialects.
- Performed spectral and phonetic feature extraction, using Wave2Vec and X-Vector embeddings, capturing 75% of the latent features.
- Outperformed the baseline SVM model by 4% by achieving notable accuracy of 86% using a LSTM structure and 88% on a fully connected architecture.
- **Tasks:** *Deep Learning, Natural Language Understanding* | **Skills:** *Python, Tensorflow, PyTorch, scikit-learn*

Machine Learning Intern — **National Center for Polar and Ocean Research** — *Goa, India* — **06/2022 - 09/2022**

- Deployed deep learning models using a range of architectures (LSTM, RNN, Seq2Seq, ARIMA) for polar weather forecasting.
- Improved the predictive performance of the model by 12% by employing feature selection tasks like Principal Component Analysis and discriminant analysis. Mitigated seasonal effects of time-series data.
- Achieved further improvement in model accuracy of the LSTM and Seq2Seq based models through hyperparameter tuning, with an RMSE score of 0.009 and MAE score of 0.006.
- **Tasks:** *Time-series forecasting, Deep Learning* | **Skills:** *Python, Tensorflow, PyTorch, statsmodels*

Projects

Virtual Memory Management Simulator | *C++, STL*

- Replicated the functionality of an operating system's virtual memory management unit, that supports a configurable paging algorithm and is capable of simulating 1 million instructions in under 3.5 seconds.

Parallel Minimum Spanning Tree | *C++, OpenMP, STL*

- Implementing parallel algorithms for Minimum Spanning Tree (MST) to optimize performance on large-scale graphs and later conducting performance comparisons between the parallel algorithms and their sequential counterparts to evaluate efficiency improvements.

Parallelizing Quad-trees for Spatial Indexing using CUDA | *C++, CUDA, STL*

- Developing a parallelized implementation for Quad-trees using CUDA for storing and quickly searching through large geo-spatial datasets.

Multimodal Image Colorization using Controlled Diffusion | *Python, PyTorch*

- Leveraged Control-Net architecture on 50,000 images to optimize image colorization and enhance self-learning capabilities. Integrated multimodal features, training for both conditional and unconditional inputs. Achieved FID scores of 94.11 (conditional) and 98.5 (unconditional) for 512x512 pixel images.

Image generation using Autoencoders | *Python, PyTorch*

- Developed and implemented Autoencoder and Variational Autoencoder (VAE) models, trained on 200,000 CelebA images. Analyzed and compared their architecture and training methodologies, achieving high-fidelity image reconstruction from incomplete and noisy data, and generating unseen images.