Iype Eldho

(224)723-6221 | iypeeldho2000@gmail.com | linkedin.com/in/iype-eldho | github.com/viper-2000

EDUCATION

North Carolina State University (NCSU), Raleigh, NC *August 2022 – July 2024*
Master of Science (MS) in Electrical and Computer Engineering with Thesis GPA: **3.926/4.0**
Courses: Machine Learning, Imaging Systems, Computer Vision, Cloud Computing, Embedded Systems

Birla Institute of Technology and Science (BITS) Pilani, Hyderabad, India *August 2018 – July 2022*
Bachelor of Engineering (BE) in Electronics and Communication Engineering

TECHNICAL SKILLS

Programming Languages: Python, C, C++, MATLAB, R, SQL
Libraries and Frameworks: TensorFlow, PyTorch, OpenCV, NumPy, Pandas, Keras, Matplotlib, Scikit-Learn
Software Development and Cloud Tools: AWS, Kubernetes, Git, Docker
Generative AI with Large Language Models – by DeepLearning.AI (Coursera)

PROFESSIONAL EXPERIENCE

North Carolina Institute for Climate Studies – Asheville, NC

- **Research and Development Associate** *August 2024 – Present*
  - Currently working on Data Extraction, Time Series Analysis, and Dataset Comparison of the Standard Precipitation Index and Standardized Precipitation-Evapotranspiration Index for any location on Earth.
- **Data Science Student Intern** *July 2023 – June 2024*
  - Created a Python model to generate maps and graphs of the US, illustrating the impact of 8 teleconnection indices on the standardized precipitation index drought using netCDF and Zarr data.
  - Developed an R-based Machine Learning (KNN, Linear Regression) model to predict drought intensity – improved model recall from 79% to 90% by analyzing teleconnection relevance.

Machine Learning Engineer Intern at Samsung Research Institute – Bengaluru, India *January 2022 – June 2022*

- Elevated the data compression capabilities of a Convolutional Autoencoder model, from 65% to 98% accuracy used in compressing and transmitting beam values within a 6G-System MATLAB simulator.

Software Developer Intern at Shalaka Connected Devices – Pune, India *May 2020 – August 2020*

- Designed a Python-driven simulator to mirror light ambient sensor data, seamlessly uploading sensor output via MQTT with 7 topics, to a cloud-based database for real-time analysis.
- Programmed 9 API functionalities to access the light sensor's control, status, and data registers.

ACADEMIC AND RESEARCH EXPERIENCE

Machine Learning Researcher at Active Robotics Sensing Lab, NCSU – Thesis (Link)

- Developed a deep learning model to classify audio as speech or cough and detect Out-of-distribution samples using transformer-to-CNN knowledge distillation, improving baseline CNN model accuracy from 91% to 98%.
- Utilized Decoupling MaxLogit and Virtual Logit Matching OOD detection methods with neural networks like WideResNet and DenseNet, achieving DenseNet AUROCs of 90.85% for OOD-Human and 82.34% for OOD-Other categories, with ViM showing superior performance.

Publication: "Robust Multimodal Cough and Speech Detection using Wearables: A Preliminary Analysis"

- Co-author of the publication and accepted by IEEE - EMBC (Engineering in Medicine & Biology) in April 2024.
- Developed a multimodal cough and speech detection and enhanced it using an Out-of-Distribution algorithm maintaining 92% accuracy after adding the OOD samples. **(Link)**

Analysis of Unsupervised Domain Adaptation Models (Python, Image Classification, PyTorch)

- Modelled Transformers and Neural Networks to assess image classification performance across domains, yielding a top F1 score of 97%, from the baseline of 76%.

Geographic Terrain Identification for Prosthetic Limb (Python, Time Series Labeling, PyTorch)

- Produced a PyTorch-based LSTM model that utilized accelerometer and gyroscope data from a prosthetic limb to identify geographic terrain types, achieving the top F1 score of 88% from a baseline of 67%.

Cross-lingual Emotion Recognition from Speech (Python, Speech Processing, PyTorch)

- Devised a Domain Adversarial Neural Network to identify emotions from a Mandarin Speech Dataset using an English dataset, achieving F1 scores of 97% & 60% in supervised and unsupervised models (20% boost).

Heartbeat Anomaly Detection (Audio Processing, TensorFlow)

- Generated a TensorFlow-based pipeline to detect arrhythmia in heartbeat sounds using SVM and LSTM models, with 78% F1-Score. Optimized the pipeline through cross-validation and Grid Search with 84% accuracy.