Atharva Pansare

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EDUCATION

Master of Science in Computer Science **May 2025**
North Carolina State University, Raleigh NC **GPA: 4.0**
Coursework: Algorithms, Neural Networks, Advanced Deep Learning, Data Analysis, Foundations of Data Science and Statistics, Object-Oriented Design and Development, Software Engineering, Database Management Systems

Bachelor of Technology in Computer Science and Engineering, **Jul 2023**
Dr. Vishwanath Karad MIT World Peace University, Pune, India **CGPA: 9.78**

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, TypeScript, C++, C, Java, R, CUDA (in progress)
Frameworks: TensorFlow, Keras, Pytorch, Flask, React, Node.js Scikit-learn, NumPy, Pandas, FastAPI, Ruby On Rails
Tools: Docker, Apache Kafka, Git, GitHub, AWS S3, AWS EC2, Postman
Database Management Systems: MySQL, PostgreSQL, MongoDB, SQLite, SQL

PROFESSIONAL EXPERIENCE

Research Assistant **Dec 2024-Present**
North Carolina State University – Dr. Debjani Sihi

- Developed and optimized process-based models of soil respiration and methane (CH_4) flux using differential equations implemented in Python and statistical analysis in R
- Estimated parameters and evaluated model performance through numerical integration, sensitivity analysis, and calibration against observational data
- Ran large-scale simulations on HPC in a Linux environment, managing remote workflows and data processing via SSH

Machine Learning Intern **Jul 2022-Jan 2023**
KPOINT Technologies Pvt. Ltd.

- Developed a real-time Thumbnail Recommendation System for the KPOINT Video Platform, using **TensorFlow** and Transfer Learning in **Python**, which had an accuracy of over 95%
- Scraped and preprocessed thousands of thumbnails from the company website, converting them to grayscale for consistent model training and increased the dataset size by 25% by using various **data augmentation** techniques
- Stored the scraped thumbnails and dataset in **AWS S3** for easy access and scalability during model training
- Built the **REST API** for model training and inference using **CherryPy** enabling real-time predictions and containerized it using **Docker** for deployment and smooth integration into the KPOINT product

PROJECTS

Large Language Models, RAG, Full Stack Web Development – Hack_NCState (2nd Place Winner)

- Developed a fraud detection web app using **Google Gemini LLM API** and **Retrieval-Augmented Generation** to analyze phone numbers, emails, and messages for suspicious activity in real-time
- Developed a **React** frontend and a **FastAPI** backend with **MongoDB Atlas** for storing and retrieving fraudulent contact reports, leveraging **vector search** to compute cosine similarity between embedded inputs.
- Collaborated in a team of 3 to design a fraud detection dataset and deploy the application within 24 hours.

Object Detection using Deep Learning – NC PSI Hackathon (Winner)

- Developed an object detection model using **YOLOv8** to classify 47 plant types from synthetic and real-world images.
- Generated a synthetic dataset with augmented plant cutouts; optimized preprocessing techniques to enhance model accuracy.
- Utilized **AWS SageMaker** for scalable model training and deployment; collaborated in a team of 4 over a 3-day competition.

Image Segmentation using Deep Learning, Computer Vision

- Implemented UNet and Res-UNet neural network archiectures from scratch using **TensorFlow** and **Keras** for brain tumor detection from MRI scans using image segmentation and pixel-based classification
- Achieved a training Dice Co-efficient of 83% and validation Dice Co-efficient of 72% for the Res-UNet model

Full Stack Web Development using Node.js, React with Apache Kafka Integration

- Developed a real-time chat application with **WebSocket**-based communication and **Kafka** for message persistence
- Built a WebSocket server using Node.js that interacts with a **MySQL** database to store and retrieve chat messages
- Implemented a Kafka consumer to listen and broadcast messages to all connected clients, using **Docker** for local Kafka development and testing

RESEARCH PUBLICATIONS

First Author, Drone Detection using YOLO and SSD: A Comparative Study (IEEEXplore link)
First Author, Personality Prediction with Natural Language Processing using Questionnaire Responses (IEEEXplore link)
Author, Remote Landslide Detection Using Semantic Segmentation (IEEEXplore link)