

ARYAN BHUSARI

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EDUCATION

University of Southern California

Los Angeles, CA

Master of Science in Computer Science

August 2024-May 2026

- Selected Coursework: Analysis of Algorithms, Deep Learning and Its Applications, Machine Learning for Data Science, Applied NLP

Maharashtra Institute of Technology

Pune, India

Bachelor of Technology in Computer Science and Engineering

October 2020-May 2024

- CGPA: 9.36/10. Selected coursework: Data structures, Machine learning, Mathematics

SKILLS

- Programming/Scripting Languages: Python, SQL (Proficient); C/C++, Java (Familiar)
- Frameworks and tools: Tensorflow, Scikit-learn, Linux, GCP, OpenCV, Matplotlib, NumPy, Pandas, GitHub, PySprak, Seaborn, Keras, Microsoft Suite (Word, Excel, PowerPoint), Jupyter Notebook, MongoDB (No-SQL), Fine-tuning LLMs, Hugging Face
- Soft Skills: Verbal and written communication skills, Problem-solving, Critical Thinking, Punctual

EXPERIENCE

Centre for Development of Advanced Computing

Pune, India

Deep Learning Intern

July 2023-December 2023

- Developed components of an **OCR pipeline** for Sanskrit manuscripts by converting handwritten content into digital form; achieved **97% accuracy** for character recognition
- Implemented word segmentation, letter segmentation and character recognition by applying NLP and Computer Vision concepts; employed technologies such as Detectron 2, Label Studio and Python

Institute of Artificial Intelligence

MIT, Pune, India

Optimization Research Intern

June 2023-December 2023

- Conducted a **swarm robotics project** using cohort intelligence algorithm, optimizing movement of multiple agents (drones) over a field under 5 combinatorial constraints by incentivizing unvisited areas
- Scaled algorithm to accommodate multiple agents, surpassing previous limit of 29 nodes; improved algorithm's scalability and efficiency, and co-authored a **research paper**

Indian Institute of Science Education and Research

Pune, India

Data Science Intern

March 2023-November 2023

- Collaborated on a research project using **satellite imagery** of Indian subcontinent from Aqua, Terra, and INSAT-3D to deliver high-resolution **Land Surface Temperature (LST)** data with **less than 5% cloud cover**
- Coordinated subsetting, re-gridding, collocation, and interpolation on 400 GB of **geospatial data** to analyze land-atmosphere interactions, urban heat islands, and environmental monitoring using libraries such as SciPy, Xarray etc.

ACADEMIC PROJECTS

PriceNet: Stock Price Prediction with Large Language Models (LLMs)

- Fine-tuned open-source** models (e.g., Llama-3.1-8B-Instruct) on binned **stock price data**, converting numeric shifts into labels and integrating historical financial news, **improving accuracy by 5-10%** over ARMA-GARCH
- Developed an **explainable** financial time series forecasting model leveraging **data distillation** from Gemini, achieving **50% binary accuracy**, **24% bin accuracy**, and a **ROUGE-2 score of 0.546** for prediction reasoning

Federated Learning for Healthcare Applications

- Built a **Federated Learning** system using principles of distributed systems with Firebase cloud, enabling secure training of a **unified global model** across multiple hospitals and 2 diseases
- Addressed regression and classification problems and ensured protection of health records; obtained accuracy comparable to non-federated models and recorded **test loss reduction of 60%** for a specific problem

Movie and Music Recommendation based on emotion

- Created a **Facial Emotion Recognition**-based Recommendation System using TensorFlow and a CNN model to identify 7 key emotions, facilitating personalized content recommendations; utilized Flask and OpenCV
- Devised an intelligent system interface to suggest mood-matching songs and movies based on **real-time emotion detection**

PUBLICATIONS

- Bhusari, A.R., Kulkarni, A.J. (2024). Drone Path-Planning leveraging Cohort Intelligence Algorithm. Book: Optimization Techniques for Sustainable Environment under Uncertainty. Series: Engineering Optimization: Methods and Applications, Springer Nature. Status: In Press