Rahul Sandip Deshmukh

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EDUCATION

Master of Science in Computer Science — Graduating in May 2025
Arizona State University, Tempe AZ — 3.83 GPA

Bachelor of Technology in Information Technology — Graduated May 2023
K.J. Somaiya Institute of Technology, University of Mumbai, India — 3.83 GPA

Relevant Courses: Data Structures and Algorithms, Statistical Machine Learning, Planning Learning methods in AI, NLP, Data-Intensive Systems for Machine Learning, Frontier Topics in GenAI, Computing for Data-Driven Optimization, Big Data Analytics, Database Management, DataMining and Business Intelligence.

TECHNICAL SKILS

Databases: MySQL, MongoDB, SQL Server Management Studio (SSMS), DBeaver, NodeJS, BigQuery
Programming Languages: C, C++, Python, Java, JavaScript, R, Julia, HTML, CSS
Tools & Software: Git, AWS, Docker, CUDA, Tableau, Alteryx, Microsoft Office, Unix/Linux, Excel, CI/CD, Agile, DevOps, Kubernetes, Hadoop, Google Cloud Platform, Azure
Libraries: Pytorch, Torch vision, BoTorch, Stable-Baselines3, OpenCV, Tensorflow, Keras, Numpy, Pandas, scikit-learn, matplotlib, NLTK, spacy, seaborn

PROFESSIONAL EXPERIENCE

Data Science Assistant, ASU Enterprise Partners — January 2024 – Present

- Developed and presented a **K-means clustering model** using **R** with **Mahalanobis distance** to segment alumni into 5 affinity groups and profile the clusters. Delivered detailed reports to key stakeholders that enhanced engagement strategies.
- Built and optimized a **predictive model for donor propensity** using **Bayesian optimization**, increasing accuracy by approximately **10%.** Shared insights with stakeholders to drive more effective fundraising strategies.
- Performed **data extraction, transformation, and loading** (ETL) processes for large datasets and conducted **exploratory data analysis** (EDA) using python libraries to produce actionable insights that informed strategic decision-making.

IOT Intern, K. J. Somaiya Institute of Technology (IT Department) — December 2021 – January 2022

- Prepared a prototype for an **Air Quality Monitoring System** that included an automatic toilet flushing mechanism triggered by high water turbidity levels.
- Implemented a gas sensor integration to monitor ammonia and air quality, with **C++** on **Arduino microcontroller** and displayed real-time data on an Android application, enabling tracking and alert notifications.

ACADEMIC PROJECTS

3D VAE Developer – Vermilion: ASU's In-house Text-to-Video Generative Model — Fall 2024 - Present

- **Initiated setup of 3D-VAE module** using CogVideo's codebase for foundational structure and early experimentation in high-quality video generation.
- Collaborated with Data and Diffusion teams to design model structure for efficient cascaded **spatial-temporal generation** across resolution scales.
- Conducted **initial experiments** addressing challenges in semantic consistency for extended video sequences, contributing to model refinement and development goals.

Harnessing Deep Reinforcement Learning for Autonomous Driving in CARLA | Github — Fall 2023

- Designed an adaptive autonomous driving agent using Deep Reinforcement Learning in CARLA simulation environment.
- Employed a **Variational Autoencoder** (VAE) for feature extraction and **Proximal Policy Optimization** (PPO) for decision-making, achieving a **mean reward of 92.3%.**
- Optimized model performance by refining reward functions and hyperparameters, demonstrating effective lane-keeping, obstacle avoidance, and precise navigation in diverse driving scenarios.

Identification and Classification of Plant Leaf Diseases | Github — Spring 2023

- Implemented **Generative Adversarial Networks** (GANs) to augment the plant leaf dataset, enhancing model performance by increasing data diversity. Used **Labelimg** for precise annotation of the dataset, ensuring accurate model training.
- Developed a **YOLO v4-tiny** object detection model for real-time detection of diseased leaves, achieving a **77.0% Mean Average precision** (mAP). Enabled mobile-based detection made in **Java** to help farmers identify diseases and apply timely remedies.

CERTIFICATIONS & PUBLICATIONS

- Deshmukh, R., Mayekar, V., Patel, S., & Rathod, M. (2023). Identification and Classification of Plant Leaf Diseases using YOLOv4-tiny Algorithm. 2023 6th International Conference on Advances in Science and Technology (ICAST), 352–357.
- Certifications: **Fundamentals of Deep Learning** (NVIDIA), **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization** (DeepLearning.AI).