

RAHUL SANDIP DESHMUKH

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EDUCATION

Master of Science, Computer Science

Arizona State University, Tempe, AZ

Graduating May 2025

3.93 GPA

Bachelor of Technology, Information Technology

K.J. Somaiya Institute of Technology, University of Mumbai, India

May 2023

3.83 GPA

Relevant coursework: 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, Data Mining and Business Intelligence, Engineering Blockchain

TECHNICAL SKILLS

Programming Languages & Web Development: Python, R, Julia, Java, C, C++, JavaScript, HTML, CSS, Flask

Data Management & Big Data Technologies: MySQL, MongoDB, SSMS, DBeaver, Google BigQuery, NodeJS, Hadoop

Cloud Platforms & DevOps Tools: AWS (S3, SageMaker, EC2), Google Cloud Platform, Azure, Docker, Kubernetes, CI/CD, Agile, Git, CUDA, Unix/Linux

Machine Learning Libraries & Data Analysis: Pytorch, Torch Vision, TensorFlow, Keras, Numpy, Pandas, scikit-learn, diffusers, OpenCV, NLTK, Excel, Tableau, Power BI

EXPERIENCE

ASU Enterprise Partners, Tempe, AZ: Data Science Assistant

January 2024 – Present

- Leading the development of an **attribution model** for Sun Devil Athletics using **Python**, **Google BigQuery**, and **GA4 data**, integrating marketing data from multiple channels to enhance ticket sales and fan engagement strategies.
- Developed 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 stakeholders to enhance engagement strategies.
- Built and optimized a predictive model for donor propensity using **Bayesian optimization**, following **ETL processes** and conducting **EDA** to increase accuracy by **10%**. Shared insights with stakeholders to drive effective fundraising strategies.

K.J. Somaiya Institute of Technology, Mumbai, India: Internet of Things Intern

December 2021 – January 2022

- Prepared a prototype for an **Air Quality Monitoring System** including an automatic toilet flushing mechanism triggered by turbidity, achieving 40% greater system automation.
- 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

- Optimized the **Variational Autoencoder (VAE)** in the **CogVideoX pipeline**, reducing GPU memory usage by **30%** through **dynamic tiling** and **gradient checkpointing** for high-resolution video generation.
- Developed and validated innovative metrics like **Optical Flow Consistency (OFC)** and **SSIM** to evaluate and enhance temporal coherence and structural fidelity across video sequences.
- Designed and tested **10+ complex prompts**, addressing challenges in **spatial fidelity** and **temporal transitions**, refining model robustness for diverse video generation tasks.

Harnessing Deep Reinforcement Learning for Autonomous Driving in CARLA

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% in dry conditions and 78.5% in adverse scenarios.
- Optimized model performance by refining reward functions and limiting training to 3 million epochs, demonstrating **lane-keeping**, **obstacle avoidance**, and **precise navigation** across diverse scenarios.

Identification and Classification of Plant Leaf Diseases

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.

PUBLICATION

- 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.