GOKUL GANDHIKUMAR

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EDUCATION

University of California San Diego, CA, USA Sept 2024 - Mar 2026 (Expected)
Master of Science, Machine Learning and Data Science
Coursework: Probability & Statistics, Software Engineering, Statistical Learning, Optimization of Deep Learning Algorithms, Machine Learning for Physical Applications, Data Management for Analytics, Generative AI, LLMs for Medicine

Anna University, Madras Institute of Technology Campus, Chennai, India Oct 2020 - May 2024
Bachelor of Engineering , Electronics and Communication Engineering
Honors: P. M. S. Iyer Memorial Prize for scoring highest grades in freshman year and sophomore year

TECHNICAL SKILLS

Programming Languages: Python, C/C++, MATLAB, SQL, JavaScript
ML Libraries: PyTorch, TensorFlow, NumPy, Pandas, Scikit-learn, OpenAI APIs, LangChain, OpenAI Gym , StableBaseline
Tools & Methodologies: Azure, AWS, chromaDB, React, Flask, Docker, Kubernetes, REST API , Git, CI/CD, Agile

WORK EXPERIENCE

AquaMesh.AI, San Diego: Machine Learning Engineer Intern Aug 2025 – Present

- Developing computer vision algorithms to automatically detect obstructions on remote IoT spectroscopy sensor lenses.
- Implementing an end-to-end cloud native pipeline on AWS that integrates data collection from edge device cameras with image processing APIs to proactively monitor sensor lens cleanliness and send alerts to users.
- Also, working on transformer based models for time-series forecasting of water quality metrics measured by our sensors.

University of California San Diego, USA: Graduate Student Researcher Feb 2025 – Present

- Currently simulating a xArm6 robot with control delays in IsaacLab and training delay compensating neural operators.
- Designed Reinforcement Learning (RL) controllers to reduce freeway congestion by optimizing traffic flow modeled with PDEs, achieving a 20% reduction in response time compared to traditional PDE backstepping controllers.
- Built a simulation environment in PDEContRoLGym library for training and validating RL models. (Repo | Docs)

PROJECT EXPERIENCE (Click here to view list of all projects)

Azure Cloud-Native Platform for ML based Intoxication Detection and Monitoring (Repo) July 2025 - Aug 2025

- Built scalable Azure pipeline for real-time intoxication detection by processing live accelerometer data from IoT devices.
- Designed ETL pipeline to extract time-series lag features and trained a random forest classifier using Azure ML studio.
- Engineered workflow using Azure IoT Hub for data ingestion and Azure Functions to execute the ML model for inference.
- Developed a web dashboard using React and Flask, deployed on an Azure VM to monitor real-time user intoxication.

SnapChef: Recipe Suggestion RAG Bot (Repo | Demo) May 2025 - June 2025

- Designed a RAG chatbot to suggest recipes tailored to user preferences and available ingredients.
- Built a vector database with ChromaDB for efficient recipe retrieval and deployed the service using Flask on Azure cloud.
- Leveraged LangChain and OpenAI LLM APIs to implement chain-of-thought prompting for generating personalized recipes based on users' preferences, dietary restrictions, available ingredients, and desired serving size.

GuidedFace: Face Image Generation based on Prompt and Facial Landmarks Image (Repo) Apr 2025 - June 2025

- Retrained text-to-image Stable Diffusion (SD) model based on ControlNet architecture to generate new face images that follows the facial structure of given input conditioning face image as well text prompts.
- Achieved 99% structural similarity to input conditioning images, with FID/IS scores comparable to baseline SD.

Interaction-Aware Motion Prediction for Self-Driving (Repo) Apr 2025 - June 2025

- Developed an interaction-aware motion prediction model that uses transformers to predict other vehicles' reactions to the autonomous vehicle's planned actions and using it to further improvise the autonomous vehicle's planned trajectory.
- Successfully performed left turns, merging, and overtaking maneuvers with a 97% success rate in testing simulations.

Watermarking of Quantized Diffusion Models (Repo) Feb 2025 - Mar 2025

- Designed a watermarking algorithm to protect & authenticate ownership of 4-bit quantized Flux text-to-image model.
- Proposed dynamic watermarking algorithm remained robust to various watermark removal attacks with 99% watermark preservation rate while preserving model performance of the baseline Flux model.