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
ML Libraries: PyTorch, TensorFlow, NumPy, Pandas, Scikit-learn, OpenAI APIs, LangChain, OpenAI Gym , StableBaseline
Tools & Methodologies: Azure Cloud, AWS, chromaDB, 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 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.