GOKUL GANDHIKUMAR

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EDUCATION

University of California San Diego, CA, USA Sept 2024 - Dec 2025
Master of Science, Machine Learning and Data Science
Coursework: Probability & Statistics, Software Engineering Principles, Statistical Learning, Optimization of Deep Learning Algorithms, Machine Learning for Physical Applications, Data Management for Analytics, Generative AI

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
Leadership Roles: Head of Software Team at Robotics Association, Vice-Chairperson of Quiz Club

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, chromaDB, Flask, Streamlit, Docker, Kubernetes, REST API , Git, CI/CD, Agile

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.

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 compesating neural operators
- Designed Reinforcement Learning (RL) controllers to reduce freeway congestion by optimizing traffic flow modeled by PDEs and demonstrated improved performance over traditional PDE backstepping controllers. (Repo | Docs)

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.

Load Balancing in 5G networks using Reinforcement Learning (Publication | Repo) Aug 2023 - May 2024
- Implemented Q-learning & Deep Q-learning algorithms for optimal user association with base stations in 5G networks.
- Developed a real-time mobile network simulation in Python and implemented RL models in PyTorch.
- Increased network data rates by 175% while demonstrating robustness to network fluctuations & user mobility.
- Work published in the Journal of Supercomputing.

Driver Fatigue Detection using Computer Vision (Repo) Aug 2023
- Developed a real-time driver fatigue detection system using facial feature tracking and computer vision.
- Built an interactive web dashboard with Flask backend to monitor and log fatigue instances on ThingSpeak cloud.
- Secured 2nd place (top 5%) in Caterpillar's CODE-A-THON 2024 among 45+ teams.