Rohith Reddy Rachala

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EDUCATION

- **University of California, San Diego** — La Jolla, California
  Master of Science, ECE, Signal and Image Processing; GPA: 3.92/4 — *Sept 2022 - Mar 2024*
  Courses: Software Foundations, Scalable Data Systems, Recommender Systems, 3D Deep Learning, Computer Vision 1, Advanced Computer Vision, Visual Learning, Deep Generative Models, Linear Algebra

- **Indian Institute of Technology, Palakkad** — Kerala, India
  Bachelor of Technology, Electrical Engineering; GPA: 8.53/10 — *Aug 2017 - Apr 2021*

TECHNICAL SKILLS

- **Programming Languages**: Python, C++, C, Javascript, SQL, PHP, Dart, OOPs
- **Frameworks**: Flask, Django, ReactJS, Flutter, Qt, gRPC
- **Technologies**: PostgreSQL, MongoDB, AWS, Kubernetes, Docker, Git, Linux
- **Machine Learning and Data Science**: AWS Sagemaker, PyTorch, TensorFlow, Sklearn, Numpy, Pandas, Matplotlib

EXPERIENCE

- **Graduate Student Researcher** — Nov 2022 - Present
  SOPAC Lab, Scripps Institute of Oceanography, UC San Diego, La Jolla, CA
  - Developed a **multi-threaded Qt-based software**, enabling real-time processing of sensor data from over 100 servers, incorporating APIs for data correction and GPS-based user interaction.
  - Engineered a **scalable server** capable of handling simultaneous client connections with secure user authentication and designed an intuitive **GUI** for monitoring client statuses and managing server connections.
  - In collaboration with NASA JPL, designed and implemented a **ML pipeline**, for classifying anomalies in extensive geodetic time series data. Developed sophisticated data visualization tools and optimized models using **distributed training on Kubernetes**, enhancing data processing efficiency.

- **Software Development Engineer, R&D** — July 2021 - Sept 2022
  ITS Planners and Engineers, Hyderabad, India
  - Spearheaded Nayanamv2 development, **a GPU-based vehicle tracking system** on edge devices, utilizing deep learning models to achieve accuracy between 85-97% based on streaming needs. Integrated **socket server** for client data broadcasting and executed **batch inference deployment** of a multi-stream processing model on Jetson.
  - Led TIMv2(Traffic Intelligence Module) and TIMv3 projects enhancing autonomous functionality, traffic signal optimization and detector integration with improvements in **server communication, traffic flow algorithms and system reliability**. Worked in **docker environments** for testing software in traffic simulation.
  - Developed server-side software with **Redis, gRPC and FastAPI** for efficient database integration and client communication. Built a **Flutter**-based Enforcement App for highway incident monitoring.

- **Software Development Engineer Intern, R&D** — Apr 2020 - Jul 2020
  ITS Planners and Engineers, Hyderabad, India
  - Engineered a solution to optimize traffic flow for emergency vehicles. Utilized **geospatial analysis** to identify traffic signals along the shortest route, enabling uninterrupted ambulance and police passage through junctions.
  - Authored **APIs** focusing on navigation and alert systems for buses. Implemented algorithms for shortest path calculations and developed real-time geo-fencing, bunching alerts to enhance public transport efficiency.
  - Deployed Open Trip Planner on an **AWS instance** for public transport and walking route planning. Contributed to the Margadarsi app using **Flutter**, focusing on features like journey planning and bus timetables.

ACADEMIC PROJECTS

- **Website for Smart Building Research**: Developed a website, featuring **React.js** frontend and **Flask API** backend for user registration and data access. Optimized **PostgreSQL** database for efficient data storage and retrieval.
- **3D-Hand Pose Estimation**: Researching **multi-modal fusion** for hand pose estimation in highly occluded scenarios. Developed a synchronized approach to collect a structured dataset from multi-view cameras and a wearable sensor.
- **Counterfactual Image Generation**: Developed a pipeline for counterfactual image generation using **GANs and neural nets**, to generate visually similar alternative images with desired attribute changes for improved image editing.
- **Instance Eraser**: Developed an algorithm inspired by Google's MagicEraser to remove specified objects from images. Utilized **instance segmentation** and Pix2Pix model for **image reconstruction**, achieving background recovery.