

# Saagar Parikh

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## EDUCATION

### Carnegie Mellon University

Pittsburgh, PA

Master of Science in Electrical and Computer Engineering

Dec 2024

Relevant Coursework: Deep Learning, Visual Learning and Recognition, Generative AI, Speech Recognition

GPA: 4.0/4.0

Multimodal Machine Learning, Large Language Models, Signal Processing, Parallel Programming, Distributed Systems

### Indian Institute of Technology Gandhinagar (IITGN)

Gandhinagar, India

Bachelor of Technology in Electrical Engineering with Minor in Computer Science and Engineering

Jul 2023

Relevant Courses: Machine Learning, Probabilistic Machine Learning, Probability & Random Processes

GPA: 9.08/10 (Rank 2)

## TECHNICAL SKILLS

**Programming Languages:** Python, C, C++, Go, CUDA, SQL, MATLAB, Verilog, Assembly, Dart

**Utilities:** PyTorch, Keras, Tensorflow, Pandas, Sklearn, Numpy, JAX, Flax, GPyTorch, Tensorboard, OpenCV, Matplotlib, Git, GitHub, OpenMP, Linux, AWS, GCP, STM32, Arduino, MeshLab, Flutter, Xilinx Vivado, LTSpice, LabVIEW

## EXPERIENCES

### Carnegie Mellon University Cylab Biometrics Center

Pittsburgh, PA

Graduate Research Assistant

Oct 2023 - Feb 2024

- Generated **Digital Surface Models** from multi-view stereo satellite images by optimizing **Neural Radiance Field** for radiometric inconsistencies such as shadows, transient objects and multi-date imagery.
- Utilized **few-shot learning** with **Segment Anything Model** to learn site-dependent styles for accurate building segmentation.

### California Institute of Technology

Pasadena, CA

Summer Research Intern

May 2022 - Jul 2022

- Formulated a robust **active learning** framework by exploiting hierarchical relations between classes to reduce human efforts by **90%** and improve the performance of existing classification models such as **DNN** and **XGBoost**.
- Analyzed billions of astronomical sources and their **time-series** representation of varying intensities (light curves) from the Zwicky Transient Facility (ZTF) survey and used API queries to visualize data for preprocessing tasks.  
**Accepted for publication in Astrophysical Journal Supplement Series (ApJS)**

### Indian Institute of Technology Guwahati

Guwahati, India

Summer Research Intern

May 2021 - Jul 2021

- Created the Face R-CNN network for **face detection** from scratch in **PyTorch** after reviewing and modifying popular object detection models such as Faster R-CNN by introducing a revised loss function and a multi-scale training strategy.

## PROJECTS

### Audio-Visual Control for Robotic Manipulation

Jan 2024 - Present

Multimodal Machine Learning ◦ Course Project ◦ CMU

Pittsburgh, PA

- Developing a novel **multimodal** approach to robotic manipulation by integrating audio cues with visual information to tackle visually challenging scenarios such as occluded scenes and collision detection.

### 3D Human Pose Estimation for Autonomous Driving

Feb 2024 - Present

Visual Learning and Recognition ◦ Course Project ◦ CMU

Pittsburgh, PA

- Enhancing real-time body pose detection and tracking by accurately estimating the 3D key points of multiple pedestrians and cyclists in the Waymo Open Perception Dataset to enable precise responses from self-driving vehicles.

### LLM Integration in Automatic Speech Recognition

Oct 2023 - Dec 2023

Speech Recognition and Understanding ◦ Course Project ◦ CMU

Pittsburgh, PA

- Boosted the Word Error Rate by **4%** on Librispeech dataset by incorporating scores of pretrained **Large Language Models** with branchformer-based end-to-end models using **Masked Language Modeling** to rescore hypotheses.

### Deep Gaussian Processes for Air Quality Inference

Jan 2022 - Apr 2022

Machine Learning ◦ Course Project ◦ IITGN

Gandhinagar, India

- Achieved state-of-the-art Air Quality inference at unmonitored locations in Beijing spatio-temporal AQ dataset using **Deep Gaussian Processes** that incorporate uncertainty and enhance reliability. **Extended abstract published** - CODS-COMAD '23

### PointResNet: Residual Network for 3D Point Cloud Segmentation and Classification

Aug 2021 - Nov 2021

Computer Vision, Imaging, and Graphics Lab ◦ Research Project ◦ IITGN

Gandhinagar, India

- Designed a **residual-block** based novel architecture in **Tensorflow** that achieved **94%** mIoU (net **4%** increase from baseline) for part segmentation on ShapeNetPart dataset and **92%** class accuracy for classification on ModelNet-10 dataset.