

Education

2019 - 2024 **B.E. Electronics and Instrumentation Engineering, BITS Pilani**
M.Sc. Biological Sciences, BITS Pilani

Work Experience

- July 2023 - Present **Research Internship, Bosch Research**
- Working with team to build a computer vision pipeline for autonomous driving.
 - Currently working on open-set object detection problems using multi-modal deep learning methods.
- July 2022 - October 2022 **Data Scientist Internship, Pixis**
- Worked on 2 major projects - Targeting AI and Video Generation.
 - Used modern ML methods to find look-alikes in 5M row dataset that helps clients target their ads to people who belong to a particular user persona. (Pandas, Tableau, AWS, Sci-kit learn).
 - Designed and Developed a GAN architecture to generate environment maps from text queries that can be used to synthesize videos based on text command. (PyTorch, OpenCV, Albumentations, ProGAN).
- May 2022 - July 2022 **Computer Vision Engineer Internship, Polybee**
- Collected data and used computer vision methods to estimate yield of crops using images.
 - Worked on training and evaluating deep learning models and developing image processing solutions for phenotyping and fruit detection, that meets the accuracy and throughput required by industry standards. (PyTorch, Detectron2, Albumentations, Git).
 - Deployed these models into production on the web platform to analyze the data collected by Polybee's drones/ handheld devices.
 - Developed a data pipeline that the team can use to extract various data points from raw images.

Selected Projects

TinyPhi - Small but capable Instruction following LLM,

- Coded the training pipeline that can be modified based on config file that allows to run multiple experiments easily.
- Created the v1 of the dataset which includes 6million pairs of instruction and response gathered and de-duplicated from other open-source datasets.
- Trained state-spaces/mamba-130m on the dataset. model

Implementation of State-of-the-art Computer Vision Architectures, Code, Code

- Various novel model architectures used in Computer Vision was implemented along with an open-source library (lightweight PyTorch wrapper) to train Computer Vision Models on custom datasets with less than 5 lines of code.

Development of Reliable, Low Complexity Models for Retinopathy, *IEEE International Conference on Image Processing 2023*, [published]

- Developed a method for iterative knowledge distillation in deep neural network models for retinopathy, resulting in simpler models (100x smaller) with comparable predictive accuracy and improved reliability as a result of calibration.

Visual Inspection of Mechanical components using visual imaging and Machine Learning, *International Conference on Processing and Characterization of Materials 2023*, [published]

- Developed and Designed a Computer Vision pipeline that is capable of classifying images based on if it has defected parts or not, and also used the Grad-CAM algorithm to localize the defect.
- The end product was a system that can categorize and localize defects in images with training data that only helps classify images.

Monocular Depth Estimation with Self-Supervised Learning, Code

- Implemented SAFENet paper that uses Self-Supervised Deep Learning methods to predict the depth of objects in 2-D Monocular images.