

# Parth Agrawal

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## Education

University of California, Los Angeles

*Expected: June '22*

Bachelor of Science, Computer Science and Engineering | GPA: 3.88

Relevant Courses: Data Structures, Algorithms, Signals and Systems, Probability and Statistics, Machine Learning, Neural Networks and Deep Learning, Data Mining, Computer Vision, Reinforcement Learning, Computer Graphics

## Skillset

Languages: Python, C, C++, Bash

Tools and Frameworks: PyTorch, Tensorflow, OpenCV, Scikit-learn, Git

## Work Experience

### Undergraduate Research Assistant, Vision Lab

*May '21 – Present*

*Advised by Dr. Alex Wong and Dr. Stefano Soatto*

- Built a framework to optimize a single set of adversarial perturbations from a dataset for stereo matching networks generalizable across networks and datasets which can increase D1 error of state-of-the-art stereo networks from 1% to approximately 87%.
- Investigating architectural designs to improve robustness of networks to adversarial perturbations by 60.5%.
- Exploring networks for removing outliers from sparse depth maps generated using lidar.

### Undergraduate Researcher, Laboratory for Embedded Machines and Ubiquitous Robots

*July '20 – April '21*

*Advised by Dr. Ankur Mehta*

- Developed communication pipeline for manual control of lighter than air vehicles using ESP8266 microcontrollers and ESP Now protocol in python and C++.
- Deployed on-device random forest and fully connected neural network models for image classification on ESP32 microcontrollers using TensorFlow lite.
- Implemented on-device monocular depth estimation on ESP EYE microcontroller. [Link](#)

### Computer Vision Intern, Tata Singapore Airlines

*July '20 – September '20*

- Explored State-of-the-Art Face Recognition architectures for face recognition as part of DigiYatra, a Government of India program.
- Developed a prototype for handwritten text recognition to automate document processing using Tesseract.

### Software Engineering Intern, Fuzzy Logix

*July '19 – August '19*

- Created framework to detect fraudulent transactions using graph algorithms.
- Developed stored procedures in SQL to preprocess data, apply graph algorithms, and visualize the network.

## Relevant Projects

### Image Processing Library for Microcontrollers

- Created an on-device image processing library to apply sobel, prewitt, and average filter on grayscale images for microcontrollers in C++. [Link](#)

### Mosaic Generator using K-Means Clustering

- Created a framework to generate mosaic images using K-means clustering in numpy. [Link](#)

### Motor Classification from EEG Dataset

- Applied the technique of knowledge distillation to train a student shallow CNN from a teacher CNN– BiLSTM network for electroencephalography 4 class motor classification using PyTorch.
- Teacher network achieved test accuracy of 51% and student network achieved test accuracy of 33%. [Link](#)

## Publications

- Zachary Berger\*, **Parth Agrawal\***, Tian Yu Liu, Stefano Soatto, and Alex Wong. *Stereoscopic Universal Perturbations across Different Architectures and Datasets*. Under Review. (\* Equal Contribution)
- Zhaoliang Zheng, Jiahao Li, **Parth Agrawal**, Zhao Lei, Aaron John-Sabu, and Ankur Mehta. *User Based Design and Evaluation Pipeline for Indoor Airships*. 39<sup>th</sup> IEEE Conference on Robotics and Automation (ICRA) 2022. Under Review