Prateek Arora

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Research Interests: Computer Vision and Artificial Intelligence.

EDUCATION

- **University of Maryland** — College Park, MD
  Master of Engineering in Robotics — *August 2018 – Present*
- **GGSIPU University** — New Delhi, India
  Bachelors in Electrical and Electronics Engineering — *2012–2016*

EXPERIENCE

- **Research Assistant** — *with Prof. Yiannis Aloimonos*
  Computer Vision Lab, University of Maryland — *August 2018 – Present*
  Quadrotors, 130 size
  Implemented point to point trajectory on quadrotor using ROS and designed Camera-IMU module (for Visual Inertial Odometry) to be mounted on 130 size quadrotor. The hardware is a tool for demonstration of optical flow algorithm on a 360 degree view camera output.
- **Research Associate** — *with Prof. Sujit and Sanjit Kaul*
  Indraprastha Institute of Information Technology, Delhi, India — *July 2017 - July 2018*
  Self-driving car (ROS)
  Worked on Vision (traffic light detection) and Path planning in Indian traffic environment. Developed lane cost algorithm to replace binary cost map and integrated it with OMPL. Also worked on system integration.
- **Research Assistant** — *with Prof. Gargi Mishra*
  Guru Gobind Singh Indraprastha University, India — *August 2014 Jan 2016*
  Worked on Gaze controller robot that is controlled using movement of eyes for Quadriplegic patient

PROJECTS

- **Deep Homography Net**: Implemented HomographyNet to estimate homography between two images. Performed panorama stitching using the homography model obtained from training.
- **Pb-Lite Boundary detection**: Implemented a version of state-of-the-art boundary detection algorithm described in Pb contour detection paper from scratch using Python which outperforms Canny and Sobel baselines.
- **Image classification using Deep learning**: Implemnted images classification using Deep learning(tensorflow) on CIFAR10 dataset.
- **VideoSnapCut-Rotobrush**: Implemented a robust video object cutout system (used in Adobe After effects) using local classifiers.
- **Structure from Motion (Monocular)**: Reconstruction of a 3D scene and simultaneously obtaining the camera poses of a monocular camera w.r.t. the given scene.

PUBLICATIONS

- **Mobile Surveillance Spheroid Robot with Static Equilibrium Camera, Leaping Mechanism and KLT algorithm based Detection with Tracking**: Shamsheer Verma, Chahat Deep Singh, Sarthak Mittal, **Prateek Arora** and Arvind Rehalia.International Journal of Control Theory and Applications, 09(41) 2016, 473-488. ISSN: 0974-5572.   (Link)
- **Control of wheelchair dummy for differently abled patients via iris movement using image processing in MATLAB**: **Prateek Arora**, Anshul Sharma, Anmoal Singh Soni, Aman Garg, IEEE INDICON 2015, doi: 10.1109/INDICON.2015.7443610   (Link)
- **Comparative study of different Gaits of a Hexapod Implemented using Inverse Kinematics and controlled via Bluetooth remote**: **Prateek Arora**, Anshul Sharma, Anmoal Singh Soni, Aman Garg, Gargi Mishra, International Conference on Quality, Productivity, Reliability, Optimization and Modeling 2017.

RELEVANT COURSES

- **CMSC 426 - Computer Vision**: Fall 2018 — *by Prof. Yiannis Aloimonos*
- **CMSC 733 - Computer Processing of Pictorial Information** : Spring 2019 — *by Prof. Yiannis Aloimonos*

SKILLS

Computer Languages: C++,Python, LaTeX
Operating System: Linux, Windows
Softwares/Libraries: Tensorflow, Numpy, Matlplotlib, Jupyter, Eagle, Matlab

REFERENCES

Yiannis Aloimonos	Dr. P.B. Sujit,	Dr Gargi Mishra,
Professor,	Associate Professor,	Asst Prof.
University of Maryland	IIIT-Delhi	GGSIPU