Abhinav Modi

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EDUCATION

University of Maryland, College Park — **College Park, MD**
Masters of Engineering in Robotics — *Aug. 2018 - May 2020*

- **GPA**: 4.0/4.0

Birla Institute of Technology and Science(BITS), Pilani — **Rajasthan, India**
Bachelors of Engineering(Hons.) in Mechanical Engineering — *Aug. 2014 - May 2018*

- **GPA**: 7.53/10(3.18/4)

Relevant Coursework: Computer Processing of Pictorial Information, Perception for Autonomous Robots, Control of Robotic Systems, Decision making for Robotics, Software Development for Robotics

TECHNICAL SKILLS

Modeling and Analysis	Solidworks, MSc ADAMS, Simulink, MATLAB
Softwares & Tools	C++, ROS, Python, Tensorflow, OpenCV, Git, NUmpy, Matplotlib, Linux, LaTex
Software development	Agile development, Automated/Manual Unit testing, Google Mock/Test framework

RESEARCH EXPERIENCE

Perception and Robotics Group, University of Maryland — *Aug. 2018 - Present*
Research Assistant under Prof. Yiannis Aloimonos

- Worked on compression of a neural network pipeline which predicts dense depth, optical flow and camera pose from a single image. Implemented compression techniques like network distillation and model quantization across different network architectures to compare the results.
- Implemented Geometric and Model Predictive based controllers for online trajectory tracking on quadrotors.

Autonomous Micro Aerial Vehicle(AMAV) Team — *Dec. 2019 - Present*
Research Assistant under Prof. Derek Paley

- Worked with a team of 20 students to develop an autonomous micro aerial vehicle to participate in the VFS MAV Student Challenge.
- Developed various vision based algorithms to generate dynamically feasible trajectories for quadrotor control.
- Winners of the 7th edition of the competition held at the University of Pennsylvania, PA in May 2019.

PROJECTS

- **GapFlyt:** Developed a vision feedback system to autonomously fly a quadrotor through a window of known dimensions but unknown position and orientation.
- **Attitude Estimation:** Implemented madgwick and unscented kalman filters(UKF) to estimate attitude of a 6-DoF IMU.
- **Advanced Lane Detection:** Developed a pipeline to detect lanes in a video sequence with variable lighting scenarios.
- **Lucas-Kanade Tracker:** Implemented an optical flow based template tracking algorithm.
- **Structure from Motion**: A 3D reconstruction of a scene from a set of several still images of the given scene.
- **WALLE 2.0:** Developed forward and inverse kinematic model of a mobile manipulator robot to aid in nursing activities in a medical setting.

LEADERSHIP EXPERIENCE

Inspired Karters, Formula Student Team, BITS Pilani — *Feb. 2016 - Feb. 2017*
Team Captain

- Established a new team structure for a team of 50 students from multiple disciplines to incorporate a KTM 390 engine, smaller wheels (10"), and a full body aero-package, all for the first time in the history of the team.
- Successfully raised INR 150,000 as a team in only one month's time, amounting to INR 7,50,000 during the whole year.