KASHISH GOYAL

Evanston, IL kashishgoyal2019@u.northwestern.edu, (312) 358-0541, **https://kashugoyal.github.io**

EDUCATION

Northwestern University, Evanston, IL

Master of Science in Mechanical Engineering, Specializing in Robotics and Control, GPA: 3.92/4.00   Anticipated Dec, 2018

Thapar University, Punjab, India

Bachelor of Engineering in Mechanical Engineering, GPA: 8.83/10.00   Jun, 2015

SKILLS

- ROS (Robot Operating System), V-Rep, OpenCV, VSLAM, Gazebo, Mathematica , Simulink (MATLAB)
- Baxter, Arduino, PIC32, Raspberry Pi, IMU, Stereo Cameras
- Python, C, Markdown, Git, HTML5/CSS, JavaScript
- PTC Pro- Engineer/ Creo Elements, DDS SolidWorks, AutoCAD, KeyShot, CorelDraw

ACADEMIC PROJECTS

Autonomous Aircraft Outdoor Navigation, Northwestern University, IL   Apr, 2018 - Present

- Set up local GPS base station for enhanced GPS precision
- Using stereo camera for online obstacle detection
- Merging GPS, IMU and visual odometry data for precise state estimation
- Skills: GPS RTK, Visual Odometry, IMU, Stereo Image Processing

Camera Smear Detection for Street View, Northwestern University, IL   Apr, 2018

- Calculated average difference between images followed by adaptive histogram equalization (CLAHE)
- Generated contours from the output image
- Filtered out the actual smear based on area constraint
- Skills : Python, OpenCV

Autonomous Quadrotor Flight, Northwestern University, IL   Jan, 2018 - Mar, 2018

- Computed roll and pitch angles from raw IMU data using complementary filters
- Used HTC VIVE as external motion capture system for autonomous mid-air position hold
- Added joystick control for mixed autonomy
- Skills : Raspberry Pi, IMU, HTC VIVE, C , PID control

Brushed DC motor control, Northwestern University, IL   Mar, 2018

- Programmed PIC32 microcontroller for motor control circuit - C programming
- Used cascaded control loops (using interrupt sequences) for current and position control
- Interfaced with Matlab using serial communication over UART
- Skills: PIC32, Matlab, Interrupts, PID cascaded control, C

Starbax, Northwestern University, IL   Nov, 2017 - Dec, 2017

- Created a ROS package, written in Python, to use Baxter arm for making coffee
- Used color and AR tags to detect the poses of cups and Keurig
- Used inbuilt inverse kinematics for Baxter to solve for target poses
- Skills: Baxter, ROS, Python, OpenCV, Robot Kinematics

Robotic Manipulation, Northwestern University, IL   Nov, 2017 – Dec, 2017

- Simulated manipulation of KUKA youBot along a given trajectory in V-Rep
- Implemented closed loop PI control to correct initial and odometry error
- Skills: VRep, Mathematica, Robotic Manipulation

WORK EXPERIENCE

VE Commercial Vehicles Ltd. (A joint venture between The Volvo group and Eicher Motors Ltd.)   Jun, 2015 – Mar, 2017

- Supported strategy development for enhancing Brand parameters such as Advocacy, Positioning and Perception, initiated
- Planned and conducted activities for improving market penetration through adding and sustaining corporate connections
- Supervised field demo trials and product validations for Heavy Duty Trucks

Eicher Tractors Ltd. (A subsidiary of TAFE Motors and Tractors Ltd.), *Internship*   Jan, 2014 – Jun, 2014

Reduction of Defects in Post-painting Area through Process Study and Improvements

- Won "Best Kaizen Award" for pioneering device for diesel fuel system priming, saving INR 6 Lacs annually
- Reduced defect in Parts per Million (PPM from 290000 to 160000 within a period of three months and Defects per Unit (DPU) (at final stage) reduced from 0.5 to 0.25