

# KASHISH GOYAL

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

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## 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

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## 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

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## ACADEMIC PROJECTS

### Autonomous Aircraft for Ag Application, Northwestern University, IL

Apr, 2018 - Present

- Working with Parrot Bebop2 developer drone, loading it with Ardupilot
- Using MAVROS package with custom scripts for controlling the aircraft
- Coverage planning and execution for a geographic bounding Box
- Skills: GPS RTK, Ardupilot, ROS, Optimal Control, Visual Odometry

### 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

### 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

### Mecanum Wheel Application for Industrial Forklifts, Thapar University, India

Jan, 2015 - May, 2015

- Created customized design for industrial application (in SolidWorks) with in-house manufacturing of the entire vehicle
- Added worm drive to eliminate necessity of a braking system
- Won the Best Project Award, leading a team of five
- Skills: SolidWorks, KeyShot, Manufacturing

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## 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