

KASHISH GOYAL

Toronto, ON

kashishgoyal2019@u.northwestern.edu, (647) 836-0541, <https://kashishgoyal.com>

PROFESSIONAL SUMMARY

I am a Robotics graduate from Northwestern University, currently employed at Kindred AI (powered by Ocado). I have been working in the capacity of Full Stack Developer, developing software technologies for Robotic and other Automation systems.

EDUCATION

Northwestern University, Evanston, IL

Aug, 2017 - Dec, 2018

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

EXPERIENCE

Kindred AI, Toronto, ON

May, 2021 - Present

Robotics Software Developer

- [Autonomous Parcel Induction](#)

Objective: Developing an autonomous robotic solution for singulating, scanning and placing parcels of various physical forms on to a slotted, moving conveyor.

Skills: Peer Mentoring, Vision based conveyor tracking, Arm Motion Planning, Distributed Systems, RPC and Data Centric Communication, Golang, Python, C++

- [Autonomous Warehouse Operations - Groceries](#)

Objective: Automate the grocery workflow from an online order to delivery, focusing specifically on order processing through autonomous bin picking and packing.

Skills: Peer mentoring, Arm Kinematics and Motion Planning, Obstacle avoidance, Hardware System Design, Distributed Systems, Scalable Architecture, Golang, Python, C++

Siemens T, Princeton, NJ

Jan, 2019 - Apr, 2021

Specialist Engineer, Robotics and Full Stack Development

- [ARM Automated Robotic Spraying and Disinfection in Shipyards and Warehouses](#)

Objective: Developing an autonomous mobile robot for disinfecting industrial environments. The robot, mounted with an arm will detect and spray areas such as door knobs, handrails, etc at a FedEx shipping/sorting warehouse facility

Skills: System Design, SLAM, Motion Planning, ROS, Angular, C++, Python Flask

- [ARM Multi-Robot Multi-Machine Interoperability](#)

Objective: Mitigated commissioning costs of robotic systems by development of inter-ecosystem gateways and modular connectors between components typical to a real world manufacturing scenario.

Skills: OPC-UA, DDS, ROS, ROS2, MTConnect

- [App Composer](#)

Objective: Supported development of a low code workflow management tool to design and create industrial process workflows. The tool contains several building blocks which can be sequenced together.

Skills: Distributed Systems, Code generation, runtime systems, C, C++, ROS, ROS2, bash

- [Abstraction Layer](#)

Objective: Contributed towards design and implementation of a runtime framework to ease multi-ecosystem, multi-language and multi-platform integration of applications. The framework is based on modular architecture with plug and play components and auto generated glue code.

Skills: C, C++, Python, Scada Systems, PLCs, ROS, ROS2, Snap7, CI/CD

Siemens T, Princeton, NJ

Jul, 2018 - Sep, 2018

Intern, Automation and Robotics Researcher

- Worked in Siemens Future of Automation (FoA) lab to integrate UR collaborative robots and vision systems
- Implemented task planning for Pick and Place type Intelligent Industrial Robotics System
- Contributed in Siemens AgPods project, using grasp quality neural networks (GQ-CNN) to plan parallel jaw grasps
- Skills: Python, C++ , Data structures, ROS, OpenCV, Deep Learning, Runtime Systems, UR robots

ACADEMIC PROJECTS

- [Autonomous Aircraft for Ag Application](#), Northwestern University, IL
 - 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
 - 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
 - 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
 - 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 Cascade control, C
- [Robotic Manipulation](#), Northwestern University, IL
 - 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
- [Starbax](#), Northwestern University, IL
 - 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