# Sanjuksha Nirgude

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## TECHNICAL SKILLS

**Languages:** C++, Python, MATLAB, HTML
**Softwares:** ROS, Linux, Git, Gazebo, Rviz, Latex, Doxygen, SolidWorks
**Libraries & packages:** PyTorch, OpenCV, TensorFlow, Keras, GTest, MoveIt

## EDUCATION

**Worcester Polytechnic Institute (WPI)** Worcester, MA
*Master of Science in Robotics Engineering* GPA: 4.0/4.0 May 2019
**University of Pune (UoP)** Pune, India
*Bachelor of Mechanical Engineering* Percentage: 71/100 June 2016

## WORK EXPERIENCE

**Symbotic LLC** *Advanced Controls Engineer* Aug 2019 – Present
- Working on automated mobile robots for warehouse automation with case under pick ability.
- Development and deployment of pick/place algorithms based on conventional and AI based control strategies.
- Working in a test driven environment while collaborating with the test team to validate algorithms.
- Implementing features for improving pick/place ability by programming, unit testing, debugging and troubleshooting.

**Waypoint Robotics Inc** *Robotics Intern* Aug, 2018 – Dec, 2018
- Assembled an AMR and developed its behavior using LIDAR data & digital IO to provide feedback to bystanders about the robot's intention.
- Expanded the robot's programming environment functionality by sensor fusion, motion planning and contributed new elements to the product GUI.
- Integrated detection DL algorithm on live video input from a mobile robot camera and developed a motion algorithm for the robot depending on this input.

**Cere Labs Pvt Ltd** *Machine Learning Intern* March, 2016 – June, 2016
- Demonstrated application of Reinforcement Learning (RL) method, specifically the Q-learning algorithm by making a crawling robot move towards a wall by itself using ultrasonic sensor data and Raspberry Pi controller.

## PROJECTS (URL)

**Atlas's Escape** *Humanoid Robotics* Jan – May, 2019
- Developed Atlas's behavior to detect and localize a door and walk towards it in Gazebo using ROS and C++.

**Automated Cinematography using an UAV** *Motion Planning* Aug – Dec, 2018
- Implemented a local RRT* path planner to avoid obstacles on a quadrotor using ROS and captured images of the Gazebo environment.

**Facial Key-point Detection** *Computer Vision Nanodegree (Udacity)* May – Aug, 2018
- Created CNN to detect 68 facial key points using image processing and deep learning.
- Used Haar Cascade face detector for faces and PyTorch to develop a 3- layered CNN for feature detection.

**Fuzzy Logic Controller for Indoor Navigation of Mobile Robots** *Robot Control* Jan – May, 2018
- Designed and implemented fuzzy logic controller (TFLC & OAFLC) on TurtleBot2 using Kinect generated stereo-vision, point-cloud & laser-scan data from RViz.

**Collective transport of Concave objects using a robot swarm** *Swarm Intelligence* Jan – May, 2018
- Implemented occlusion based collective transport strategy for transport of concave objects in C++ by converting them to convex objects by filling the concavity by swarm of Khepera IV robots in ARGoS.

**Detection, Recognition, Pose Estimation of Objects** *Deep Learning for Perception* Aug–Dec, 2017
- Achieved 98% accuracy in object recognition and an average of 85% in angle estimation on TableTop dataset.

**Badminton Playing Robot** *ABU RoboCon* March, 2014 –March, 2015
- Designed a mechatronic solution for two badminton playing robots to detect and localize shuttle using pure visual information.

## VOLUNTEER EXPERIENCE

**Co-Organizer Women in Robotics Boston Chapter** March, 2020 – Present
**Robotics Outreach Program** March, 2015 – Dec, 2016