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 Wilmington, MA
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 Merrimack, NH
Robotics Intern Aug, 2018 – Dec, 2018
- Developed various behaviors in the mobile robot, which involved use of LIDAR data, digital IO and robot motion to provide feedback to bystanders about the robot's intention.
- Developed, tested and integrated a motion planning algorithm to extend the capabilities of the mobile robot.
- Expanded the robot's programming environment functionality by sensor fusion, including the contribution of new elements to the Graphical User Interface.
- Took part in the assembly of mobile robots.
- Integrated detection deep learning 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 Mumbai, India
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.
- Manufactured and trained the CURL (Crawling using RL) robot using Raspberry Pi as the controller and implemented the algorithm in Python.

PROJECTS (URL)

Atlas's Escape *Humanoid Robotics* Jan – May, 2019
- Completed a task of detection and localization of a door in an environment, walking towards the door and opening it using the Atlas Humanoid robot by Boston Dynamics in Gazebo.
- Simulated in Gazebo using ROS and C++.

Automated Cinematography using an UAV *Motion Planning* Aug – Dec, 2018
- Implemented a Motion Planning algorithm on a quadrotor to find a path in an environment while avoiding obstacles and capturing images of the environment.
- Simulated in Gazebo and used ROS for communication.

Facial Key-point Detection *Computer Vision Nanodegree (Udacity)* May – Aug, 2018
- Created CNN to detect facial key points on eyes, nose and mouth using image processing and deep learning.

- Used PyTorch to develop a 3- layered convolutional neural network for feature detection.

Fuzzy Logic Controller for Indoor Navigation of Mobile Robots *Robot Control* Jan – May, 2018
- Designed a fuzzy logic controller (FLC) to carry out the decision-making processes to reach the goal in cluttered environment. Sensor readings are inputs and wheel accelerations are outputs.
- Using the Tracking FLC and Obstacle avoidance FLC as the two major parts of the controller.

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.
- Converted the concave objects to convex objects by filling the concavity by swarm of robots.
- The algorithm was written in C++ and the experiments run in ARGoS simulator.

Detection, Recognition, Pose Estimation of Objects *Deep Learning for Perception* Aug–Dec, 2017
- Detected and identified three table-top objects: stapler, mug and mouse
- Developed a 4-layered convolutional neural network that determined the orientation of the object placed on a table.

COMPETITION

Asia Pacific Robotics Contest (ABU RoboCon) March, 2014 –March, 2015
Badminton Playing Robot
- Designed a mechatronic solution for two badminton playing robots, for serving and returning.
- Robot uses non-modified shuttles and rackets, which are detected and localized using purely visual information

VOLUNTEER EXPERIENCE

Co-Organizer Women in Robotics Boston Chapter March, 2020 – Present
- Organize technical seminars, panel discussions aiming to inspire and enable more women to enter and grow in the field of robotics.

Robotics Outreach Program March, 2015 – Dec, 2016
- Taught Robotics to middle school children by organizing workshops and seminars.

NGO Volunteer 2006 – 2012
- Organizing and participating in events to spread awareness about and to stop spread of life threatening diseases at the time.

OTHER INTERESTS

- Musical Instruments, KickBoxing, Archery