Sanjuksha Nirgude

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Education

Worcester Polytechnic Institute (WPI) **Worcester, MA.**
Master of Science in Robotics Engineering, *GPA – 4.0*. May 2019
Relevant Courses: Deep Learning for Advance Robotic Perception, Synergy of Human and Robot, Foundations of Robotics, Robot Control, Robot Dynamics, Swarm Intelligence.

University of Pune (UoP) **Pune, India.**
Bachelor of Mechanical Engineering, *Agg–71 %* . June 2016

Skills

Softwares: ROS, SOLID EDGE & CATIA, Arduino, , Latex, , ARGoS, Mocap, MS Office (word, power point, excel)
Languages: Python, MATLAB, Buzz, C++

Internship

Machine Learning Intern *Cere Labs Pvt Ltd.* **Mar-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

Collective transport of Concave objects using a robot swarm **Present**

- Implementing occlusion based collective transport strategy for transport of concave objects.
- Converting the concave objects to convex objects by filling the concavity by swarm of robots.
- The algorithm is being written in C++ and the experiments run in ARGoS simulator.

Baxter Kinematics and Dynamics Library **Present**

- Developing a python library for forward and inverse, pose and velocity kinematics and dynamics for Baxter robot.
- Extending options for arm control and providing cross-platform usability.

Fuzzy Logic Controller for Indoor Navigation of Mobile Robots **Present**

- Designing 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 controller parts.

Robot Learning from Demonstration: Trinia via MoCap , *WPI***.** **Aug-Dec 2017**

- Tele-operated a nursing robot (Baxter) using MoCap system to track the human arm motion to map it on Baxter.
- Implemented Reinforcement learning on three finger reflex-sf hand for grasping objects.

Detection, Recognition & Pose Estimation of Tabletop Objects, *WPI***.** **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.

ASIA PACIFIC ROBOTICS CONTEST (ABU ROBOCON)

Badminton Playing Robot, *UoP*. **2014-2015**

- Designed a mechatronic 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.

Hybrid Robot driving Eco robot through an indirect energy source, *UoP***.** **2015-2016**

- Designed and manufactured two robots (eco robot, hybrid robot) for carrying equipment in hazardous environments using Arduino as the controller.
- The eco robot used wireless charging from the hybrid robot to travel through a zig-zag path using color sensors for line following.

Achievements

- Secured 5th position in India in ROBOCON 2015
- Secured 1st position in state level archery competition in 2010.

Extra-curricular

- Taught Robotics to middle school children by organizing workshops and seminars.
- Volunteered at a local NGO Sanjeevani Foundation for 6 years.
- Participated in Entrepreneurship Awareness Camp (MITCON) 2014.