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, Robot Control, Robot Dynamics, Swarm Intelligence, Computer Vision Nano-degree(Udacity), Motion Planning

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

Skills

Softwares: ROS, PyTorch, Arduino, OpenCV, Latex, ARGoS , Mocap, MS Office (word, power point, excel)
Languages: Python, MATLAB, Buzz, C++, HTML

Internships

Robotics Intern *Waypoint Robotics Inc.* **Aug-Dec 2018**

- Developed various behaviors in the mobile robot, which involved the 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, 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.

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

Automated Cinematography using an unmanned aerial vehicle **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 **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 **Jan-May2018**

- 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 **Jan-May2018**

- 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.

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.

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.