Snehal Dikhale

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EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA
M.S., Robotics Engineering, GPA: 3.8/4.0 **May 2020**
Relevant Coursework: Human-Robot Interaction, Machine Learning, Motion Planning, Robot Dynamics & Controls.

Pune Institute of Computer Technology, Pune, India
B.Eng., Electronics & Telecommunication, Grade: First Class with Distinction **June 2018**
Relevant Coursework: Object-Oriented Programming, Data Structures & Algorithms, Embedded Systems, AI.

SKILLS

Programming Languages: Python, C++, MATLAB, Embedded C
Software/OS: Linux (Ubuntu), ROS, GIT, Pytorch, CUDA, PCL, OpenCV, Docker, Rviz, Unreal Engine 4, Gazebo, MoveIt!, AutoCAD, Solidworks**,** Blender, Real-Time Operating System, HTML, LaTex.

WORK EXPERIENCE

Research Engineer, Robotic Manipulation, Honda Research Institute (HRI), CA **Aug 2020 – Present**

- Designed Deep Learning algorithms using vision and tactile feedback to estimate the 6D pose of an in-hand object under heavy occlusion and set up the entire pipeline.
- Generated a simulated RGB-D and tactile dataset and performed a sim2real transfer.
- Compared the performance with a pose estimator using Vision data alone and conducted several ablation studies.
- Deployed the algorithms on various robotic hardware setups with different grippers and tactile sensors.
- Contributed as an inventor for two patents filed by Honda, first author for a RAL paper presented at ICRA ‘22, and second author for two conference papers submitted to ICRA ‘23.

Graduate Teaching Assistant, Electrical and Computer Engineering Department, WPI **Oct 2018 – March 2020**

- Conducted bi-weekly office hours, lab sessions, and graded assignments/exams for a batch of 80 students.

Mentor: Women’s Research and Mentorship Program (WRAMP), WPI **Sept 2019 – Dec 2019**

- Mentored an undergraduate female student and two high school girls to ignite their interest in pursuing STEM.

PUBLICATION

Presented at ICRA: S. Dikhale et al., "VisuoTactile 6D Pose Estimation of an In-Hand Object using Vision and Tactile Sensor Data," in IEEE Robotics and Automation Letters, DOI: 10.1109/LRA.2022.3143289. **May 2022**

RESEARCH EXPERIENCE

Comparative Analysis of two Robotic Grasping Algorithms, (Directed Research), WPI **Aug 2019 – May 2020**

- Designed a simulation environment using Gazebo Moveit Rviz for the Panda Robotic Arm with a Parallel Jaw Gripper and a Realsense Camera attached to the wrist for testing.
- Integrated GQCNN and GPD (two Deep Learning Algorithms) for Robotic Pose estimation of objects, from RGB-D and Point cloud data, with the testing setup.
- Acquired a success rate of 78% for GQCNN and 65% for GPD on grasping ten objects in an identical setup.

Predicting Building’s Energy consumption using Machine Learning, WPI **Oct 2019 – Dec 2019**

- Participated in a three-member team to examine the Cost Benefit Analysis of energy consumption in buildings using ML models.
- Applied Linear Regression, Random Forest, Decision Tree, and a three-layer Neural Network model.
- Achieved a Root Mean Square error of 1.27 and made it to the top 30% on the Kaggle leaderboard

Human-Robot Handover, WPI **Sept 2018 – April 2019**

- Collaborated on a four-person team to design an experimental setup using ROS and Python for a human-robot handover study to predict the Object Transfer Point (OTP)
- Collected data using Kinect Sensor, trained, and tested ProMPs and performed Data Analysis.
- Predicted the static OTP with root mean square error less than 0.2m and inferred that variance of OTP and evidence of intent primarily affected the level of collaboration.

AWARD

Recipient of WIN Women’s Young Investigator Fellowship **Sept 2019**