Karsh Tharyani

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OBJECTIVE

Seeking a full-time position in the domain of, but not limited to, planning, manipulation, perception, and control.

EDUCATION

Carnegie Mellon University **Pittsburgh, PA**
School of Computer Science **December'18**
Master of Science in Robotic Systems Development GPA: 3.95/ 4.33
Relevant Coursework: Intro. to Machine Learning, Manipulation Estimation and Control, Systems Engineering, Intro. to Computer Vision, Robot Autonomy, Planning and Decision Making, Statistical Techniques in Robotics, Principles of Software Construction.

Malaviya National Institute of Technology **Jaipur, India**
Bachelor of Technology in Mechanical Engineering GPA: 8.76 / 10.00 **May'17**
Interesting Coursework: Kinematics and Dynamics of Machinery, Computational Fluid Dynamics, FEM.

SKILLS

Programming Languages: C, C++11/98/MSVC++ (Proficient), Python 2.7(Proficient), MATLAB, Java
Libraries worked with: OpenCV, ROS, OpenRAVE, MoveIT(familiar)
Software: Microsoft Visual Studio 2017, Git, Vim, Unix, Linux, Autodesk Inventor, Fusion 360.
Unit-Testing Frameworks: MATLAB runtests, gtest.

WORK EXPERIENCE

The MathWorks Inc. **Natick, MA**
Engineering Development Group Intern **May'18 – August'18**

- Prototyped constrained forward dynamics of closed chain mechanisms for the Robotics Systems Toolbox.
- Implemented uniform random sampling of rotations in SO(3). χ^2 and unit-tested the underlying distribution to demonstrate proof of correctness of the sub-group algorithm.
- Hackathon: MATLAB Gourmet – an app that reads a cafeteria food label and shows the nutrition value in it.

PROJECTS

TartanBot
Carnegie Mellon University **February'18 – May'18**

- Incorporated and tuned ROS navigation stack for a robot that autonomously traverses the university campus, using GPS, and a time of flight sensor using a Time Elastic Band Local Planner
- Integrated point cloud filters for sensor-noise reduction.
- ROS based action client-server communication to request GPS waypoints and send action goals.

Assistive Intent Recognition and Manipulation
Carnegie Mellon University **July '17– May'18**

- A system identifying user's intent in the form of a gaze and speech and to assist in picking and placing intended objects.
- OpenRAVE libraries and Personal Robotics Python(PrPy) Planners for grasping objects (minimum peripheral distance between any two objects-10 cm); Used CHOMP and Bi-RRT to reduce planning times.
- Developed a polar-heuristic planner to select objects to move before grasping target object using above.
- Non-blocking action client-server in ROS that takes a target ID to pick objects within 1 minute.

Drunken Driving Prevention System (DDRIPS; Patent Pending)
Malaviya National Institute of Technology **March'15 – July'16**

- Devised a sequential-check algorithm involving motor skills-based tests to test for drunkenness
- Developed the tests' apparatus using XBee, Arduino MCU, and seven-segment displays; 3D Printed apparatus designed on Autodesk Inventor.

A Pipe Traversing Robot
Malaviya National Institute of Technology **October'13 – January'14**

- Prototyped a 3DOF r, θ, z pipe traversing robot; designed on Inventor with custom 3D printed parts and wireless comm. with motor-driver ICs.