Yug Ajmera

Roboticist

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Education

BITS Pilani Hyderbad Campus **Hyderabad, India**
B.E.(Hons.) Mechanical Engineering, Minor in Data Science, *2017 - 2021*
CGPA : 8.57/10.0

Zydus School For Excellence **Ahmedabad, India**
ISC (Class XII), 94.6% *2017*
Received 7 scholar trophies for academic excellence.

Skills

- **Experienced**: ROS, Gazebo, RVIZ, Python programming, Arduino and Raspberry Pi Interfacing, Soldering skills, HTML, CSS, Javascript, LaTeX.
- **Intermediate**: MoveIt, Java programming, C programming, Git, Linux, SolidWorks, Creo, IoT, OpenCV, AutoCAD, 3D printing, MATLAB.
- **Familiar**: V-REP, Android Studio, Processing 3, C++ programming.

Internships

APTRI Labs **Ahmedabad, India**
Summer Intern, *May 2019-July 2019*
Developed ALFA - An open-source floor-assistant robot, that can be controlled over the internet. Assembled electronics, wrote shell scripts and employed the Lighttpd webserver.

Vinnan Labs **Hyderabad, India**
Research Intern, *October 2018 - February 2019*
Worked on "Autonomous UV Sterilization Robot" based on ROS which was funded under BIRAC Innovation Challenge, SoCH. Wrote scripts to perform trajectory record and playback and implemented 3D mapping in ROS using Octomap.

Publications

- Ruchik Mishra, **Yug Ajmera**, Nikhil Mishra, Arshad Javed, Ego-centric Framework for a three-wheel omni-drive telepresence robot, 15th IEEE International Conference on Advanced Robotics and Its SOcial Impacts (ARSO 2019) (Accepted).
- **Yug Ajmera**, Robot User Interface : Web applications for control, mapping and navigation of mobile robots, Journal of Automation, Mobile Robotics and Intelligent Systems (Under Review).

Projects

Mobile Robotics

Telepresence robot **Mechanical Dept.**
Social Interaction using ego-centric framework. *Mar 2019-May 2019*
Worked under Dr.Arshad Javed for the development of a three-wheel omni-drive telepresence robot. The autonomous control is achieved by recognizing the person to be tracked bi-directionally through an ego-centric framework.

Robot User Interface **Personal**
Suite of remote driving tools. *Apr 2019*
Employed utilties such as robot web tools, roslibjs, rosbridge and roswww to create web interfaces that allow users to teleoperate as well as autonomously navigate mobile robots in unknown environments.

Keyboard teleop for three-wheeled omnidirectional robots **Personal**
wiki.ros.org/teleop_keyboard_omni3 *Mar 2019*
Performed motion analysis of three-wheeled robots and extended the results to develop the control algorithm. This package has been added to ROS package index. The code was initially tested on a Gazebo simulation and then extended to an actual robot.

Autonomous navigation of differential drive robots **Personal**
github.com/YugAjmera/navros_pkg *Feb 2019*
Implemented ROS Navigation stack on a Gazebo simulation of a custom differential driven car. SLAM algorithm is used for mapping and creating local and global cost maps. Used Dijkstra's algorithm for path planning and the robot localization is carried out using Adaptive Monte Carlo localization algorithm.

Aerial Robotics

Visual navigation for quadrotor **Personal**
github.com/YugAjmera/quadrotor_ros *Oct 2019-Present*
Implemented Monocular SLAM using PTAM (Parallel Tracking and Mapping) on a Gazebo simulation of a quadrotor.

Autonomous control of Drone using on-board micro-controller **CS Dept.**
Development of ROS packages for autonomous control. *Aug 2019-Present*
Currently working under Dr.Paresh Saxena to build a drone based on Raspberry Pi. The autonomous behavior will be implemented onboard using the ROS framework.

Industrial Robotics

Robotic Arm **Personal**
github.com/YugAjmera/rosarm_pkg *Jan 2019-Feb 2019*
Created a custom URDF model of a manipulator robot in Gazebo and performed motion planning using MoveIt and python scripts.

Medical Robotics

Smart Spoon **Mechanical Dept.**
Fabrication of Low-cost spoon for people with hand tremors. *Aug 2019-Present*
This project is being done under Dr.Sujith R. and Dr.Amrita Priyadarshini. The PID control algorithm will be used to keep the spoon stable and the body will be 3D printed.

Arduino Projects

- **Humanoid Robot** - Designed the robot on Solidworks and wrote the walking algorithm.[Project Link]
- **Voice Controlled Car** - Most viewed project with 28K+ views on arduino.cc.

Positions of Responsibility

Hyperloop India
Software Lead *Ongoing*
Currently leading the software team of Hyperloop India for the Hyperloop Pod competition organized by SpaceX.

Student Mentorship Program
Mentor *2018-2019*
Conducted classes for freshmen and sophomores on the basics of ROS.

Automation and Robotics Club (ARC)
Treasurer *2018-2019*
Conducted, taught, and mentored numerous workshops related to robotics for freshers and sophomores. Executed and managed the activities of the club.

References

Prof. Paresh Saxena
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