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.
- **Intermediate**: MoveIt, Java programming, C programming, Git, Linux, SolidWorks, Creo, IoT, OpenCV, AutoCAD, LaTeX, 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, 2019 IEEE International Conference on Advanced Robotics and Its SOcial Impacts (ARSO) (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

navros_pkg **Personal**
ROS package for autonomous navigation of differential drive robots. *February 2019*

Implemented ROS Navigation stack on a Gazebo simulation of a 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 Monte Carlo localization algorithm.

teleop_keyboard_omni3 **Personal**
Generic keyboard teleop for three-wheeled omnidirectional robots. *March 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.

Robot User Interface(RUI) **Personal**
Web applications for control, mapping and navigation of mobile robots. *April 2019*

ROS package that allow users to teleoperate as well as autonomously navigate mobile robots in unknown environments through web applications.

line_maze_ros **Personal**
ROS package for solving line mazes using OpenCV *August 2019*

Implemented multiple centroid tracking algorithm to follow lines and used the left-hand rule to solve the maze. The results of the algorithm were verified using Gazebo simulations.

Aerial Robotics

Autonomous control of Drone using on-board micro-controller **CS Deptartment**
Development of ROS packages for autonomous control *Ongoing*

Currently working under Dr.Paresh Saxena to build a drone based on Raspberry Pi. The autonomous behavior will be implemented onboard in Python using the ROS framework.

Hexacopter **Personal**
A six rotor drone built using APM flight controller *August 2018*

This project was funded under the Student's Union Technical Challenge 2018.

Medical Robotics

Smart Spoon **Mechanical Deptartment**
Low-cost spoon for people with hand tremors *Ongoing*

This project is being done under Dr.Sujith R. and Dr.Amrita Priyadarshini. The aim of this project is to fabricate a low-cost self-adjusting spoon for people with Parkinson's disease. The PID control algorithm will be used to keep the spoon stable.

Arduino Projects

- **Humanoid Robot** - Designed the robot on Solidworks and wrote the walking algorithm.
- **Voice Controlled Car** - Most viewed project with 24K+ 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.

Gujarati Association
Secretary *2018-2019*
Organized 'Dandiya Night' - a cultural dance event at BITS Pilani, Hyderabad which was attended by over 1000 students for which a fund of 60,000 INR was raised.

References

Prof. Paresh Saxena
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