SMART INDIA HACKATHON 2022

Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation:
Government of Rajasthan

PS Code: TK1048

Problem Statement Title: To build robots for all kinds of dedicated tasks such as cleaning shoes, planting crops, cleaning windows, etc.

Team Name: ARES 007

Team Leader Name: Bhavuk Grover

Institute Code (AISHE): U-1056

Institute Name: Netaji Subhas University of Technology

Theme Name: Robotics and Drones

Idea/Approach Details

- Developed a Multitasking robot with USP of performing multiple tasks with single setup.
- Dexterity and Flexibility is the key which has been inculcated to perform multiple tasks.
- KISS (Keep it Simple & Stupid) design principle is used to make it simple, so it could be used by anyone with extensive training.
- Future goal is to make "Fully Autonomous" multitasking robot.

Multi Tasking Robot With Exchangeable End Effector

Describe your Technology stack here:

- CAD Modelling (Solidworks, Autodesk Fusion)
- ROBOT OPERATING SYSTEM(ROS)
- Gazebo and Ubuntu
- Computer Vision (Depth Camera)
- Machine Learning and Microelectronics

Idea/Approach Details

Describe your Use Cases here

- Directly **reduce the workforce of the mankind** in performing day to day life activities
- Domestic helps such as **maids can be replaced with smart robotic systems** which will be **more reliable and safe for the home**.
- These r**obots can be very well used in the hospitals in case of pandemics where human interaction has to be minimized.** For eg – Could be used in COVID wards to do the activities such as **Serving Food, collecting garbage etc.**
- This could also be used in **orphanages, Old Age home to perform daily activities.**

Describe your Dependencies / Show stopper here

- **Visual Inertial odometry failure:** Since our autonomous robot is guided by the Visual Inertial Odometry, failure of any form may occur in cameras, sensors, or inefficiently computing outliers.
- **Overheating** is very common with electronic devices, which may cause performance problems and even can damage the components.
- **Failure of Telescopic Arm:** Gears of the arm may get jammed as well as creeping in the links of the robotic arm due to load.

Team Member Details

Team Leader Name: Bhavuk Grover

Branch (Btech): Stream (ME): Year (IV):

Team Member 1 Name: Mayank Pandit

Branch (Btech): Stream (MPAE): Year (IV):

Team Member 2 Name: Gaurav Verma

Branch (Btech): Stream (ME): Year (IV):

Team Member 3 Name: Ritesh Saini

Branch (Btech): Stream (ME): Year (IV):

Team Member 4 Name: Satvik Sharma

Branch (Btech): Stream (ECE): Year (IV):

Team Member 5 Name: Charu Singh Choudhary

Branch (Btech): Stream (MPAE): Year (IV):

Team Mentor 1 Name: Dr. Mohinder Pal Singh Bhatia

Category (Academic): Expertise (Embedded Systems): Domain Experience (30+ years):

Team Mentor 2 Name: Manu Sheel Gupta

Category (Academic): Expertise (Principles of Engineering for Embedded wireless systems): Domain Experience (15 years):