Adding "*Google Assistant"* to the Double 3 robot

The prime application of a double 3 robot is telecommunication. It enables people to be connected to their colleagues by giving them a physical presence where they can't be in person. But why use our double 3 robots for telecommunication only.

The idea behind adding google assistant to the double 3 robot is to make it useful when there are no remote calls on it. Google assistant offers voice commands, voice searching and voice-activated device control thus enabling you to do a number of tasks once you have said "OK GOOGLE" or "HEY GOOGLE" wake words. Double 3 robot has 6 Digital Microphones with beamforming and 8-Watt full range speakers which can easily interact with voice commands.

We can also build custom commands for google assistant that allows us to perform certain actions of the bot with our voice.

Google can smartly pull information of the company where the double 3 robot is used and thus present you the information which is relevant to you and your company. If you feed the profile data of every employee of your company into the double 3 robot, you can get access to the profile of any employer by using google assistant by just calling the employee's name.

Face Recognition and locomotion

Broader Perspective: We can enhance the virtual presence of a person over Double 3 robot by implementing face recognition of various employees of the company.

Hardware Specifications: Double 3 robot already has sensors which can be used to implement face recognition and autonomous locomotion.

Idea in detail:

- Suppose I want to interact with certain employee of my company using the double 3 robot
- Command can be given remotely specifying the name of the employee.
- The robot will then look into database for the image of that employee and start searching for the employee around it (360 degree)
- We can further this idea by moving the robot autonomously in case the face it is looking for is not in the field of view or the person is out of range of detection.
- Once the face is confirmed, the robot will navigate autonomously to the person's location

Future scope: Further, we can teach the robot about the office environment. This will improve its performance. Certain ideas which we have in mind are:

- No movement to restricted areas like conference rooms etc.
- Automatically navigate to the charging spot when not in use for a certain amount of time.

GESTURE RECOGNITION AND CONTROL OF DOUBLE 3 ROBOT

- The double 3 has an advanced array of various sensors in multiple places.
- These sensors are used when driving the robot via physical commands from a software interface.
- **We had the idea of implementing gesture recognition using the depth sensor and cameras on the bot**
- Certain gestures can be mapped to certain controls, for example -
    - An arrow pointing up could be linked to the bot raising its height.
    - A flat hand implying halt could be used to stop whatever movement/motion is taking place.
    - An arrow pointing down could be linked to the bot lowering its height.
    - A push gesture towards the bot (sensed using the depth sensor) could be used to initiate a backward movement away from the user and vice-versa.
    - A rotate gesture using the fist could be used to rotate the robot by a certain angle.
- Gesture can be as basic or as complex as we want them to be.
    - Of course initially we would start with the basic ones and work our way up.
- Gestures would give the user a much more natural and intuitive way of controlling the bot.
- These could especially come in healthy when the user is preoccupied with other tasks and cannot necessarily access the physical controls required to move the robot.
- Once we have the basics down, the possible applications to this gesture recognition system are endless…

INTEGRATION OF D3 WITH OCULUS QUEST

In this we are thinking of using the camera in double 3 bot, which will send 2d video to the screen of laptop and then we will convert this 2d video to a virtual reality clip which can be used in oculus quest. This conversion can be done using softwares like VirtualDub, the only thing necessary is a great processor. The head of the bot will also be synchronised with the oculus quest i.e. if a person wearing oculus rotates his/her neck the head of bot will also rotate in the same way. Also the oculus Gamepad can be added to give full control to the user, it will be an addon and used only for precision or for very short distance travel. A new feature can also be put on the role which can be used to get questions from the students or take messages from the host to the employer. This feature can be accessed via spelling a word like questionbot and the bot will set its mike on record the audio until the person having the question spells questionbotover. So this is all about integration with oculus quest and its applications.