

TELEPRESENCE ROBOT

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ABSTRACT

Telepresence robot is a custom built robot system specifically designed for augmented Telepresence with assisted control. It allows user to remotely interact with other users and provides an effective communication. An Arduino mega2560 is used for controlling purpose and for processing using application of its own features. The main objective of our robot is to develop a fully robotic platform that pairs with Android phone or tablet. Telepresence robots can be deployed in wide range of application domains. A Telepresence robot is a computer, tablet, or Smartphone-controlled robot which includes a video-camera, screen, speakers and microphones so that people interacting with the robot can view and hear its operator and the operator can simultaneously view what the robot is "looking" at and "hearing."

Keywords: *Arduino mega 2560, Encoder motor, ESPN, IR sensor, Relay.*

I. INTRODUCTION

Telepresence robots are mobile robot platforms capable of providing two ways audio and video communication .recently there has been a surge in companies designing telepresence robots. We conducted a series of user studies at Google in mountain view with two different commercially available telepresence robots .based on the data collected from the user studies ,we present a set of guidelines pertain to video, audio, user interface, physical features and autonomous behaviors [2].

1.1 NATURE OF PROBLEM

1.1.1 Circulation time may kill important information.

The circulation of any kind of information to every room in each floor can consume a lot of time if it is done by human. The robot can travel to each and every room for distribution of the information or memo which has to be circulated regularly.

1.1.2 Human counting cannot maintain accuracy in storehouses.

The routine of counting products everyday in big storehouses is must to keep a record. If the stores are big then it would be difficult or sometimes the count may miss. Therefore we replace human labor with robot. This robot

is flexible, portable and a versatile solution for counting the number of objects in a store. There will be no hassle in nothing down the information of the materials and also keeps a clean record of it.

1.1.3 Work cannot be done if you are sick.

Instantly meet with the coworkers for crucial conversations and just log in and be there as you would be in person. Being with your coworker in a conference meeting means a telepresence robot is the only best thing than actually being there when you are not well [1-5].

BLOCK DIAGRAM:

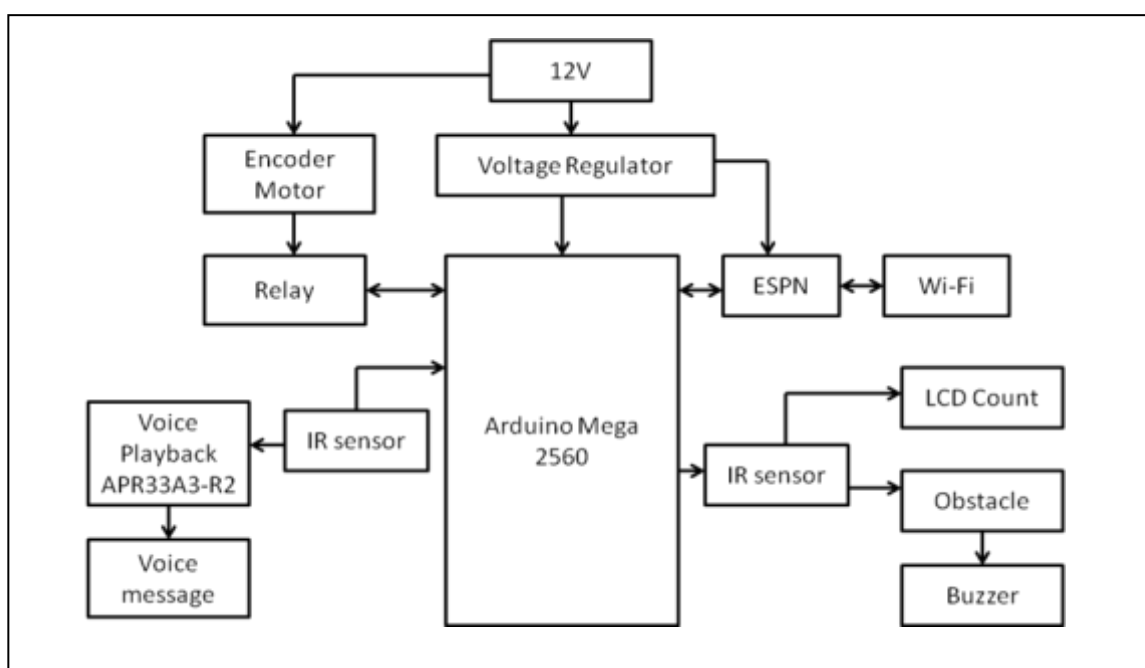


Fig 1. Block diagram of working of telepresence robot

II.PREVIOUS WORK

Telepresence robotics is a sophisticated form of robotic remote control in which a human operator has a sense of being on location – that is, of being telepresent. We propose a demonstration of two telepresence robots, one floor model (VGo) and one tabletop model (KUBI). In this proposal, We describe the technology and briefly summarize the research that led to the purchase of the robots. The research focused on the telepresence needs of a mobility impaired academic and included a user study as well as a review of the affordances of commercially-available telepresence robotic devices. There is a growing need for technology to support remote participation in professional and personal activities, due to crowded highways and airways and an environmental imperative to reduce fossil fuel consumption [2-7].

III. PURPOSE

2.1 For the circulation time that may kill while delivering important information's Our Robot can travel to each and every classroom for distribution of the memo which has to be circulated regularly. For example: Holiday circulars, Announcement of time tables etc.

2.2 As the human counting in storehouse will not be accurate, our robot will make sure it that there will be no hassle in noting down the information of the materials and also keeps a clean record of it. As this Robot is flexible, portable and a versatile solution for counting the number of objects in a store.

2.3 Instantly meet with coworkers for crucial conversations and just log in and be there as you would be in person. Being with your co-workers in a conference meeting means a telepresence robot is the only best thing than actually being there when you are not well.

IV. WORKING

The Telepresence robot is mainly built with a screen which is mounted on a chassis and is controlled with Arduino mega 2560. The movement of the robot is automatic and also can be controlled by the wifi module through the local host for long range interaction. Raspberry Pi with the camera is used for the conferencing purpose. The main components gathered are Arduino mega 2560, raspberry pi, wireless camera, relay, encoder motor, IR sensors, and voice input module. After the connection was complete, testing of the setup was done to make sure that it could be controlled. To control the server, a local server is used to catch the user initiated events. Our main focus was on artificial intelligence to improve the user experience. While the robot is navigating if any obstacle appears it counts and the robot stops and produces beep sound and moves to the destination. The navigation of robot can be controlled by the wifi module. The navigation path can also be projected to the user. The robot moves and circulates the circular or the voice input given to it and delivers it to the classrooms. The robot senses the sensor and stops and takes the turn and produces the message in the class[2]. To produce the message firstly the voice input module is required to store the voice information. For commercial purpose it can be used in the storehouses where the products are counted which are placed and the IR sensor senses it and thus sends the obstacles reading and displays the count on the LCD. The third one is the video conferencing which can be done in the workplace where a person can sit far away and can handle the important meetings with the virtual presence with the help of this robot. The LCD display is mounted on the chassis with a certain height where the conferencing of the video is built. Finally coming to the chassis portion a lot of things had to be considered like the height, weight of the setup so that the robot could balance and conveniently accommodates the components on it. Balancing the robot on two wheels is also the challenge that had to be faced that has to be provided to prevent it from tilting the setup.[4-11]

V.RESULT

As per the assembling and program that is embedded on to the robot boards, our robot will move to each class and will give the messages which in loaded to it by the input voice recorder. Secondly it will sense the product and give the count of the product on the LCD display as it moves. Finally this robot can also be used as a media for video conferencing in workplaces and can be controlled with the remote access. It enables user to have a mobile presence from anywhere.



Fig 2.

Shows

the



complete assembling of component in the basement of the robot

Fig 3. Shows the product count displayed on screen

VI. CONCLUSION AND FUTURE WORK

We presented the telepresence robot and is a research platform for navigation, perception and the human –robot interaction. We introduced the three applications with different levels leading to several research challenges. However, advancement in remote controllable devices continues to progress along with video conferencing technology which benefits telepresence Robotic field. Hence it full-fills business objectives by giving great value to time and also cut downs overhead expenditure. This robot proves to be an emerging technology that can be greatly utilized broadly. For research platform we have a basic model of our Telepresence robot, by making further modification in weight that is by reducing it the robot can be used as a guide in museums, Universities and hotels. By installing speaker phones and microphones on this Robot will take a step further more in

interaction of the robot personally and taking video conferencing to another level which could be helpful in educational field.

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