DESIGN AND IMPLEMENTATION OF AN ECONOMICAL HUMANOID

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Abstract- In the present-day scenario of the advances, Robotics goes approximately because the mainstay to dominant a part of developments. One such development are the human-like robots or "Humanoids". These are enhancing machines with a view to in fashionable impersonate maximum sports of a human in fact sites. Achieving this success calls for large quantity of human actions, facts on sizeable stage improvements simply as a financial care. The vital operating of a humanoid out of doors a mechanical arch needs to be like that of a human, and this actually drills down use of some among the best devices for particular obligations like better purpose cameras, powerful engines and simple stage programming. This effects in better tempo of such technologies on bazaar. Our undertaking manages taking maximum intense actions in decreasing the rate of the Humanoids without lowering its highlights via way of means of a maximal part and fostering a humanoid that can cooperate without problems withinside the social world. Besides, our venture substance may be modified in keeping with the general prerequisite of its usage.

Keywords – ESP32, Humanoid, MIT app, Google firebase.

I. INTRODUCTION

People were related to the Earth throughout recent times. They generally have attempted to facilitate their responsibility by finding ground-breaking thoughts and carrying out them into the real world. For example, people have presented the world with different valuable developments, regardless of whether be it the steering wheel, switch, train, etc. As seen, the humankind developed machines of elective figures and dimensions. To create and work these technologies, there was an enormous necessity of Resource which prompted the indecencies of human servitude, wars, abuse of common assets and a lot more worries.

Today, dominant part of ventures has supplanted the human limb with the automatic ones to do different monotonous assignments absent a lot of endeavours included. these arms when appended to a mechanical body constructs a character like us. With the advancement of innovation, seeing these apparatuses in an industry is normal. Be that as it may, with the term being close human, their claim outside the ventures is restricted for the time being. Around a couple of social robots that can collaborate with people however they have their individual limitations, perhaps it be the highlights or expense.

Essentially, once we catch wind of humanoids, its highlights and appearance are the ones that fosters a plenty of inquiries to everybody. Can it catch me? Would it be able to talk as we do? These are not many of the inquiries that we as a whole need to be replied and find in a humanoid.

The relaxation of the paper is prepared as follows. Proposed algorithms are defined in phase II. Experimental effects are offered in phase III. Concluding comments are given in phase IV.

II. PROPOSED ALGORITHM

Economical humanoid – consists of various minor functions and modules embedded in it. Each and every system has a specific function and has a reason to implement.
The system is majorly divided into 4 groups

i. Obstacle detection
ii. Motion and gesture control using MIT app
iii. Environment monitoring
iv. Storing data in google Firebase.

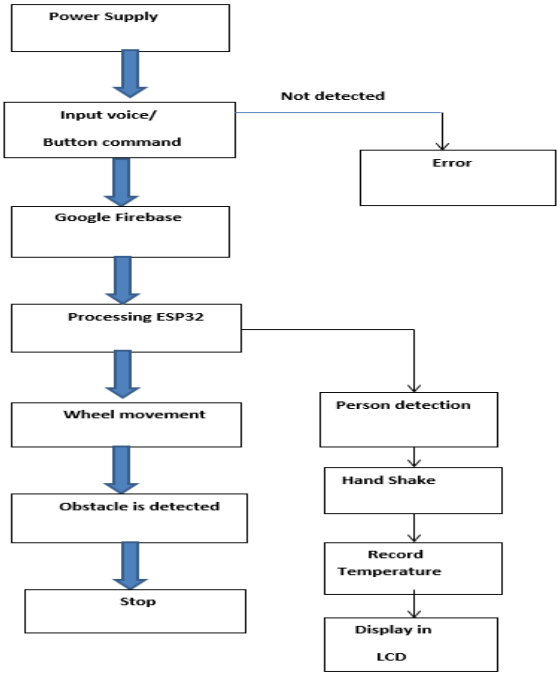

Figure 1. Working Algorithm of Humanoid

2.1 Obstacle Detection

We have implemented obstacle Detection as a key feature in the Humanoid. The humanoid uses a ultrasound sensor attached at the face, serving as the eyes for the humanoid for obstacle detection. This is connected to ESP32 board. We have used an Open CV library function in ESP 32 to control the sensor. Once the object is detected, the humanoid then greets the person using its hands as a greeting gesture. It is programmed to detect any obstacle depending on any condition.

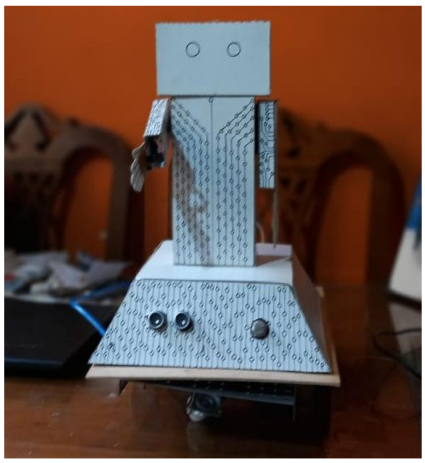

Figure 2. Placement of Ultrasonic Sensor in Humanoid

2.2 Command

The Humanoid can be controlled (movement controls) by simple commands using a smartphone. A Bluetooth module is connected to the humanoid for transmitting and receiving signal from any smartphone device via Bluetooth. The

smartphone should be installed with a pre-programmed Bluetooth application. Now when the user commands the humanoid using his smartphone, the Bluetooth module receives the command, and transmits the command to ESP32. As the texts matches it follows the command, all of this application is happening in real time.

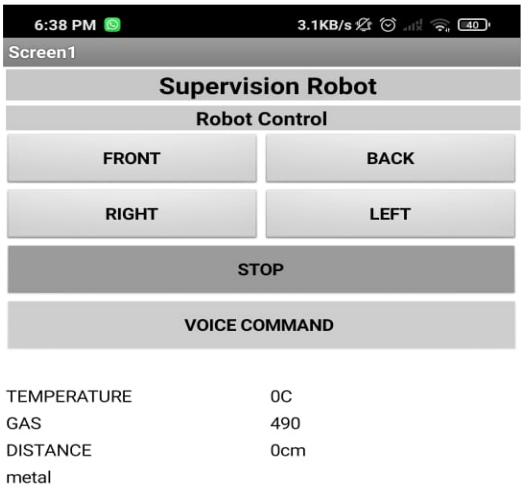

Figure 3. Android app screen

For more precise and accurate movement controls, the humanoid needs to be controlled using a handy wireless device for more precision. Hence, we have designed a app which can control the humanoids movement more rigorous. As the app transmits data, the humanoid receives the signal and acts according to it. it has a range of 1.1kms so the humanoid can be controlled even for long distances.

2.2 Hand Gestures

A humanoid is incomplete without its hands. We have provided with a simple structured hand for lightweight body. On the shoulder where the hand meets the body a servo motor is fixed. It is controlled using an ESP32 and motor drive. Hand gestures like greetings can be performed using this servo motor powered arm. At the down bottom of the hand, we have placed a temperature sensor so that the humanoid will detect the temperature of the opposite body.

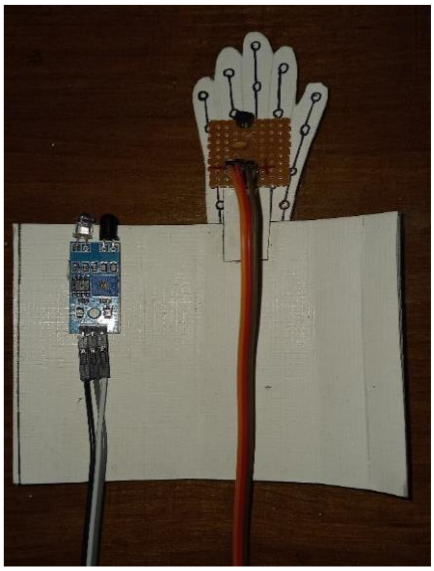

Figure 4. Servo Controlled hands with temperature sensor

2.4 Temperature and Air Quality

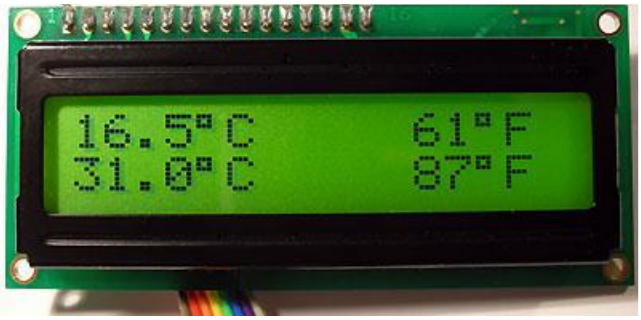

Figure 5. Temperature and Air Quality Monitoring Display

Apart from movement and commands this humanoid can perform basic temperature and air quality sensing. It uses a LM35 temperature sensor for calculating temperature. An MQ-06 air quality sensor for sensing the emission in the air. This is displayed in a small 16x2 LCD screen. All these components are connected to a single ESP32.

IV.CONCLUSION

As the knowledge rises quickly, we have viewed robots and humanoids waged for people in productions, workshops, storerooms, and laboratories. But a humanoid which is communicating in every way thereby decreasing the danger of putting persons in industries and increasing the low-cost is always efficient to keep up with. Humanoids and robotics will offer great profits to humanity in the future. These humanoids can take the responsibilities which are deemed dirty and hazardous. Our main goal and priority remain the same, to carry out tasks without any harm done to the humans and as economical as possible. Hence these humanoids are like humans without defects. Lastly, as the skill advances, there'll be new ways to use humanoids which will be able to bring new hopes and new potentials.

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