Contactless Robot for Virus Attacked Hospitalized People

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ABSTRACT
Very important and initial challenge in the epidemic of Covid-19 is to identify more probable patients out of crowd of people. Once identified, probable patients may be sent for more Covid-19 test for identification. This initial challenge is tickled by using thermal imaging with the use of thermal cameras over the entire world. It requires the manual operation for scanning of people. It is so risky for human being that handles the whole operation of scanning. Humanoid robot is designed for instructing, alerting and scanning of entering peoples for the sake of more prevention from Corona virus. Low-cost humanoid robot is designed using plastic body. All the corresponding motions are modelled for particular action for scanning of person in front of it. Activation of data capturing and scanning schedule is initiated once entry of person is identified using PIR proximity sensor. Temperature data recorded is analysed and decision is taken place by opening and non- opening. Buzzer, voice indication with SMS alert is given by robot for further action if scanned data is found abnormal. Whole Robot system is implemented and is tested for real time operation. It is found working satisfactorily.

1. INTRODUCTION

COVID-19 is a major epidemic that was spread over the entire World. Automation and less human assisting systems are required for controlling the viral effect of this disease. Manual assistance required for scanning is needed to be avoided. Thermo-graphic scanning is a proven technology based on infrared imaging used in a wide range of applications like monitoring, diagnosis of industrial machines and products and diagnosis of health. Many thermal cameras like ARBOR SENSOR SYSTEM [3], FLIR [4], SATIR [5], FLUKE [6], etc are available in market having different resolutions, features. Some thermal cameras are having the facility of data communication using Ethernet port [3] and some models of FLIR [4] like FLIR E5 [7] and FLIR E8 [7] are having wi-fi facility for capturing and getting the information. Since 1985, thermal imaging devices are used for fever detection by Walter T. Hughes [8]. He stated that the most accurate readings were got along the area near eye and E spot- area below the ear lobes. Later based on many clinical studies[9-12] recommendation through different publications of ISO[13], IEC[14] and the reviews of CDC[15], the best area to scan a person´s body temperature is the inner portion closest to the nose where your tear ducts called eye's Lacrimal Caruncle area and the hole of ear. Some of the researchers also recommended to average the temperatures over large area of face or along fore head. Some major companies like Amazon and Walmart are scanning temperatures of their employee with handheld thermometer. Scanner must be close enough to the people for checking that may lead to infection [16]. Witha thermal camera, thermal scan is possible automatically.

2. PROPOSED METHOD

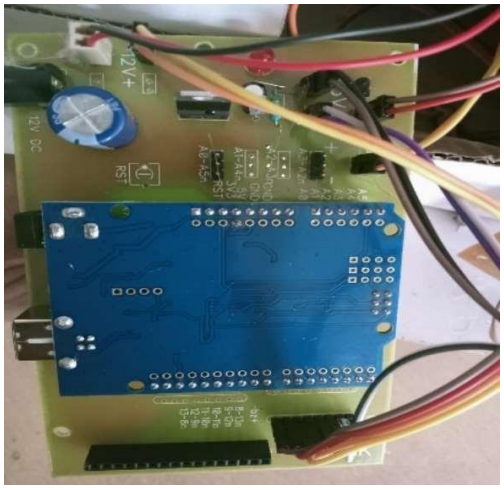
The proposed system may solve the defined problem in most of the extent. Proposed systemincludes Humanoid Robot System having major three capabilities as movement capability distance measurement and temperature calculation. System also includes Temperature sensing System that is designed for sensing by three waysas sensing of the object availability, detecting the object .

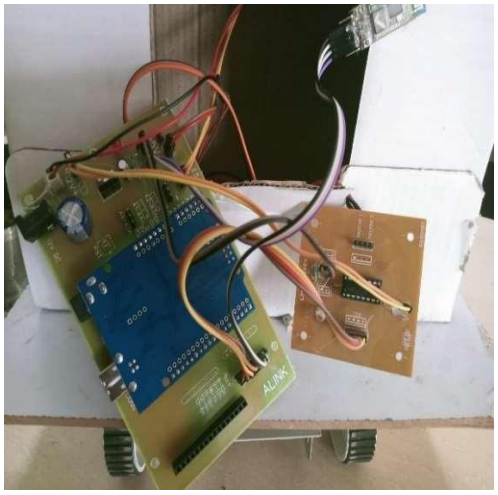
Data is sent from System to Humanoid Robot System through Bluetooth connectivity using HC-05module, number of ultrasonic transmitter and receiver pairs for head position detection, System is processed by ARDUINO controller and then sent to Robot System for further operations. A no vel

approach of Data Analysis with Motion Modelling is proposed for the specific operation of Humanoid Robot System that controls the motion of robot for exact positioning and for distance thermo-graphic measurement. High resolution thermal scanner having data accessing facility is used for thermo-graphic measurements. After proper moving/positioning of robot hand (having attached scanner) by robot, it captures thermo-graphic image and also records the temperature of the target person. It is exactly positioning and focusing on forehead of the entered person. If motion found is excides it limit then the whole process from getting positional information until the scanning is repeated. Main controller used for Robot System is low cost Arduino Uno that can handle all the operation of Robot System like motion control, initialization of scanning and instructing &alerting like operations. Data is sent from System to Humanoid Robot System through Bluetooth connectivity using HC-05module, number of ultrasonic transmitter and receiver pairs for head position detection, System is processed by ARDUINO controller and then sent to Robot System for further operations. A no vel approach of Data Analysis with Motion Modelling is proposed for the specific operation of Humanoid Robot System that controls the motion of robot for exact positioning and for distance thermo-graphic measurement. High resolution thermal scanner having data accessing facility is used for thermo-graphic measurements. After proper moving/positioning of robot hand (having attached scanner) by robot, it captures thermo-graphic image and also records the temperature of the target person. It is exactly positioning and focusing on forehead of the entered person. If motion found is excides it limit then the whole process from getting positional information until the scanning is repeated. Main controller used for Robot System is low cost Arduino Uno that can handle all the operation of Robot System like motion control, initialization of scanning and instructing &alerting like operations.

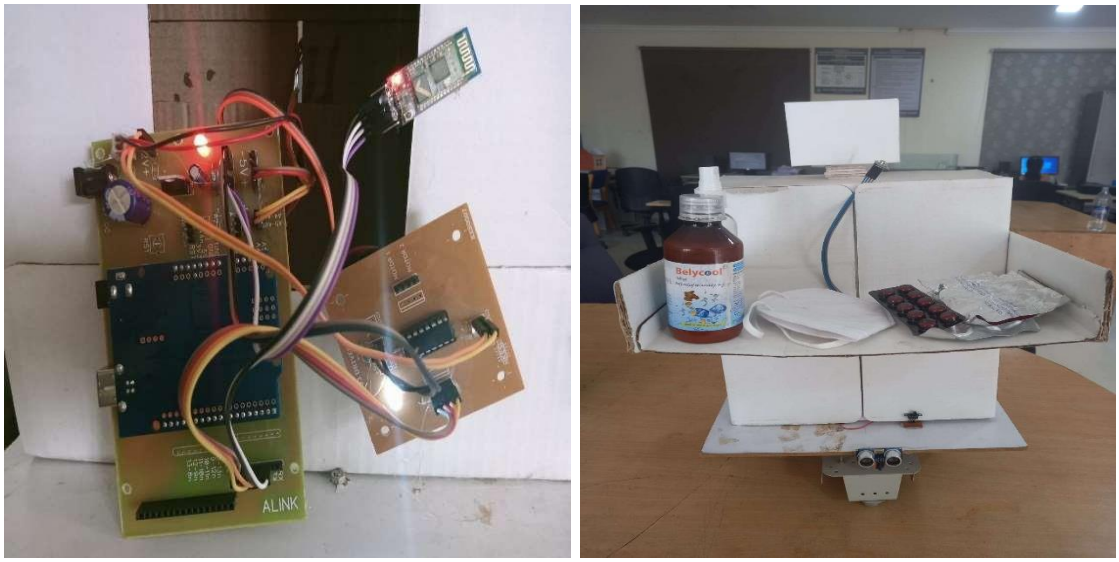
3. RESULTS

Step 1: Circuit diagram of the Contactless Robot for Virus Attacked Hospitalized People**.**





Step 2: Working of Circuit.



Step 3: Output of the Project.

4. CONCLUSION

During the epidemic of Covid-19, it is necessary to identify the probable patient during un- lockdown condition. Thermal scanner is the best option to identify the fever of any person from distance manner to avoid the infection to other people. In this work, we proposed autonomous humanoid robotic controlled system that identifies the his/her position, and his/her distance. It scans the forehead of person for temperature measurement using thermal scanner. Recorded temperature is analysed and Corresponding instruction and alert is provided by the robotic system. Implemented system is working properly and useful to check the persons for theidentification of their health conditions.

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