ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 12, Iss 1, Jan 2023

CONTACTLESS ROBOT FOR VIRUS ATTACKED HOSPITALIZED PEOPLE

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ABSTRACT
This project describes the evolving role of robotics in healthcare and allied areas with special concerns relating to the management and control of the spread of the novel coronavirus disease 2019 (COVID-19). The prime utilization of such robots is to minimize person-to-person contact and to ensure cleaning, sterilization and support in hospitals and similar facilities such as quarantine. The Robot measure the Body Temperature and Heartbeat of the patient.This will result in minimizing the life threat to medical staff and doctors taking an active role in the management of theCOVID-19 pandemic.

1. INTRODUCTION
1.1 Motors
Motor is a device that creates motion, not an engine; it usually refers to either an electrical motor or an internal combustion engine.

It may also refer to:

- Electric motor, a machine that converts electricity into a mechanical motion
- AC motor, an electric motor that is driven by alternating current
- Synchronous motor, an alternating current motor distinguished by a rotor spinning with coils passing magnets at the same rate as the alternating current and resulting magnetic field which drives it
- DC motor, an electric motor that runs on direct current electricity
- Brushed DC electric motor, an internally commutated electric motor designed to be run from a direct current power source
- Brushless DC motor, a synchronous electric motor which is powered by direct current electricity and has an electronically controlled commutation system, instead of a mechanical commutation system based on brushes

1.2 TYPES OF MOTORS
Industrial motors come in a variety of basic types. These variations are suitable formany different

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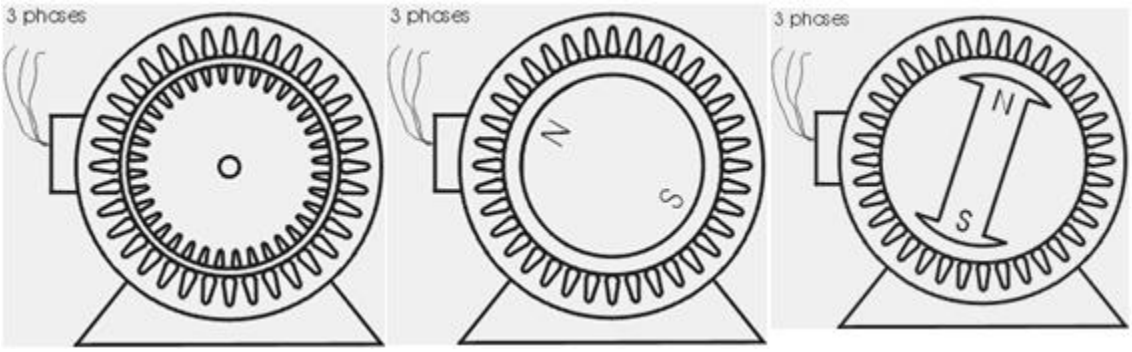
applications. Naturally, some types of motors are more suited for certain applications than other motor types are. This document will hopefully givesome guidance in selecting these motors.

➢ AC Motors

The most common and simple industrial motor is the three phase AC induction motor, sometimes known as the "squirrel cage" motor. Substantial information canbe found about any motor by checking its (nameplate).



Advantages

- Simple Design
- Low Cost
- Reliable Operation
- Easily Found Replacements
- Variety of Mounting Styles
- Many Different Environmental Enclosures

➢ DC MOTORS

The brushed DC motor is one of the earliest motor designs. Today, it is themotor of choice in the majority of variable speed and torque control applications.

Advantages

- Easy to understand design
- Easy to control speed
- Easy to control torque
- Simple, cheap drive design

2. LITERATURE SURVEY

A service robot performs various professional services and domestic/personal services useful for organizations and humans in many application domains. Currently, the service robot industry is growing rapidly along with the technological advances of the Fourth Industrial Revolution. In light of the great interest and potential of service robots, this study conducts a systematic review of the past and current research in service robots. This study examines the development activities for service robots across applications and industries and categorizes the service robots into four types.

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The categorization provides us with insights into the unique research activities and practices in each category of service robots. Then, this study analyzes the technological foundation that applies to all four categories of service robots. Finally, this study discusses opportunities and challenges that are understudied but potentially important for the future research of service robots.

We focus on how robots can provide benefits to patients, healthcare workers, customers, and organizations during the COVID-19 pandemic. Furthermore, we investigate the emerging focal issues of effective cleaning, logistics of patients and supplies, reduction of human errors, and remote monitoring of patients to increase system capacity, efficiency, resource equality in hospitals, and related healthcare environments.

3. SOFTWARE TOOL

3.1 ARDUINO SOFTWARE:

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals-has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

3.2 MC PROGRAMMING LANGUAGE: EMBEDDED C -

This is the most widely used programming language for embedded processors/controllers. Assembly is also used but mainly to implement those portions of the code where very high timing accuracy, code size efficiency, etc. are prime requirements. Embedded C is perhaps the most popular languages among Embedded Programmers for programming Embedded Systems. There are many popular programming languages like Assembly, BASIC, C++ etc. that are often used for developing Embedded Systems but Embedded C remains popular due to its efficiency, less development time and portability.

- **PROTEUS:**

Proteus is a simulation and design software tool developed by Lab centre Electronics for Electrical and. It also possess 2D CAD drawing feature. It deserves to bear the tagline “From concept to completion”.

- **ABOUT PROTEUS:**

It is a software suite containing schematic, simulation as well as PCB designing.

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ISIS is the software used to draw schematics and simulate the circuits in real time. The simulation allows human access during run time, thus providing real time simulation.

ARES is used for PCB designing. It has the feature of viewing output in 3D view of the designed PCB along with components.

The designer can also develop 2D drawings for the product.

- **FEATURES:**

ISIS has wide range of components in its library. It has sources, signal generators, measurement and analysis tools like oscilloscope, voltmeter, ammeter etc., probes for real time monitoring of the parameters of the circuit, switches, displays, loads like motors and lamps, discrete components like resistors, capacitors, inductors, transformers, digital and analog Integrated circuits, semi-conductor switches, relays, microcontrollers, processors, sensors etc.

ARES offers PCB designing up to 14 inner layers, with surface mount and through whole packages. It is embedded with the foot prints of different category of components like ICs, transistors, headers, connectors and other discrete components. It offers Auto routing and manual routing options to the PCB Designer. The schematic drawn in the ISIS can be directly transferred ARES.

4. STARTING NEW DESIGN

Step 1: Open ISIS software and select new design in File menu

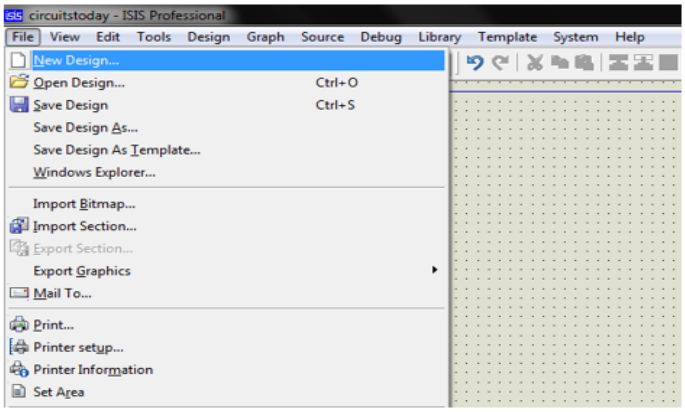

FIG 4.1: Proteus File Menu

Step 2: A dialogue box appears to save the current design. However, we are creating a new design file so you can click Yes or No depending on the content of the present file. Then a Pop-Up appears asking to select the template. It is similar to selecting the paper size while printing. For now, select default or according to the layout size of the circuit.

Step 3: An untitled design sheet will be opened, save it according to your wish, it is better to create a new folder for every layout as it generates other files supporting your design. However, it is not

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mandatory.

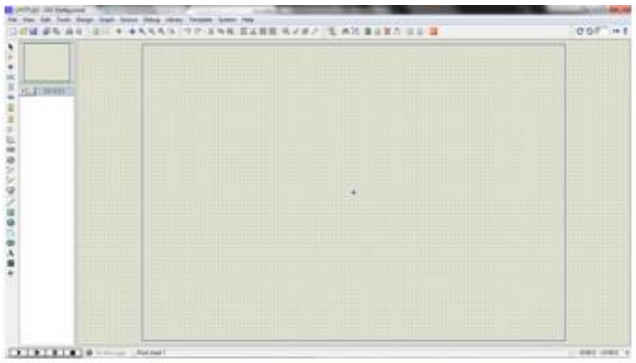

FIG 4.2: Proteus Design Sheet

Step 4: To select components, Click on the component mode button.

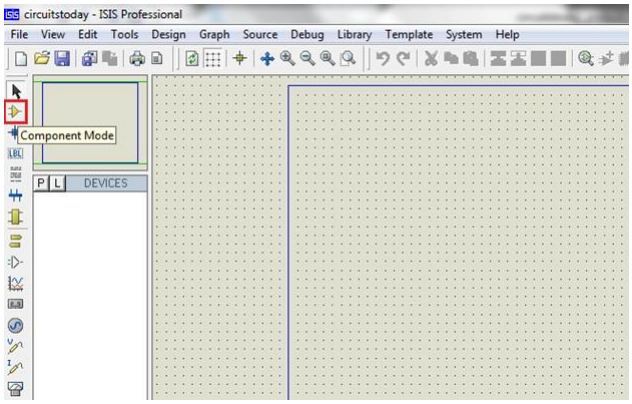

FIG 4.3: Component Mode

5. RESULT

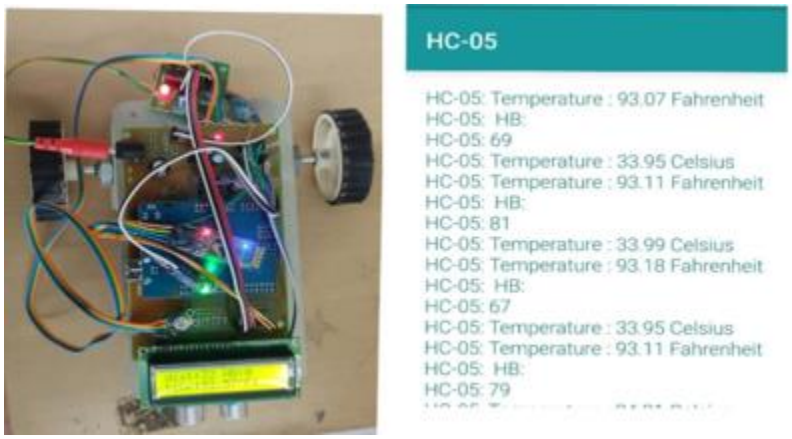

FIG-4.4: OUTPUT

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6. CONCLUSION

The results obtained from this study reveal that the implementation of robotics into the healthcare field has a substantial effect in controlling the spread of SARS-CoV-2, as it blocks corona virus propagation between patients and healthcare workers, along with other advantages such as disinfection or cleaning. In our work, we proposed a concept for an assistance system in hospitals to encounter the effects of pan- demics such as COVID-19. The components of such a system consist of the contactless measurement of health state for patients and medical staff, of robots with several assistance and guiding function and the implementation in a secure hospital infrastructure.

7. FUTURE SCOPE

We need to perform more studies on the social impact of such robots. Due to COVID restrictions, we have only been able to evaluate the performance of COVID-robot in our low to medium density laboratory settings. Eventually, we want to evaluate the robot's performance in crowded public settings and outdoor scenarios. We also need to design better techniques to improve the enforcement of social distancing by using better human-robot interaction methods.

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