

Design and Development of Robot for Pandemic Cycles

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Abstract – Robots are becoming frequent in almost every industry, from healthcare and manufacturing to defense and education. Also, it is the most promising evaluation to the upcoming world. All set to play an important role in this upcoming society. By and large, robots are customized to perform explicit assignments. This restricts the utilization of these robots. To build the utilization of robots where conditions are unsure, for example, firefighting or salvage activity we can make robots which adhere to the directions of a human administrator and play out the undertaking. Along these lines' choices are taken by the working conditions by the administrator and undertaking is performed by the robots in this manner we can utilize these robots to play out those errands that might be unsafe to people. Likewise, this framework is introduced for the society at minimum cost. Which can be used in any type of pandemic situation in hospitals for the safety of doctors and other staffs in the hospitals. Also, it will help in all types of hospital usage which will surely human effort and interference with the critical patients. As it can be modified as per required and all necessary changes can be made.

Key Words: Robots, Covid-19,

1. INTRODUCTION

Robotics is a branch of engineering and science that includes electronics engineering, mechanical engineering and computer science and so on. This branch deals with the design, construction, use to control robots, sensory feedback and information processing. The first use of the word 'robot' appeared in 1921 in the play Rossum's Universal Robots (RUR) written by the Czech writer Karel Capek. It was a fictional manufacturer of mechanical creatures designed a robot to replace human workers. As of late, solid endeavors have been done to create keen and regular interfaces among clients and PC put together frameworks based with respect to human motions. Motions give an instinctive interface to both human and PC. Along these lines, such motion-based interfaces can substitute the regular interface gadgets as well as be abused to broaden their usefulness.

1.1 SIGNALS (TRANSMITTER/RECEIVER)

The objective of signal acknowledgment in the Computer Science field has consistently been the minimization of the separation between the physical world and the advanced world. Various calculations have been proposed to accomplish the objective of signal acknowledgment and its utilization in speaking with the advanced world.

1.2 MOTORS

Also, motors being the most useful part for the movement of the robots, and can help us to trace the path with help of its required torque and rpm.

1.3 MICROCONTROLLERS

Microcontrollers being the brain of the body stores all the required data and which are feed to control wirelessly

2. PROPOSED WORK

Covid-19 is most dangerous pandemic happening all over the world. Right now, there are a lot of dynamic research going on all over the world. A few methodologies are being created in all over curing this disease. Also, lot of doctors are facing some types of illness due to full day wearing masks and other ppe kits, approaching the patients they may also come in contact with the pandemic. In future we may face such kind of pandemic. To minimize approach to the patients, a robot is developed for the hospitals. Which will carry medicines and other food items as per required. The technician of a person can simply drive the robot to the patient keeping all the required things on it using using transmitter. Which is as simple as front, back, left and right. Camera can also be mounted on the front for the easy usage of the driver, to control the robot.

The robot can be modified as per the need if someone wants to deliver things to patients one kind of a case can be used, if someone wants to bring things from medical shop another type of chassis can be used. In this file all the purposes are discussed.

2.1. CIRCUIT DIAGRAM

Here is the circuit diagram for the microcontroller(Arduino), the motor driver, battery, motor and the receiver.

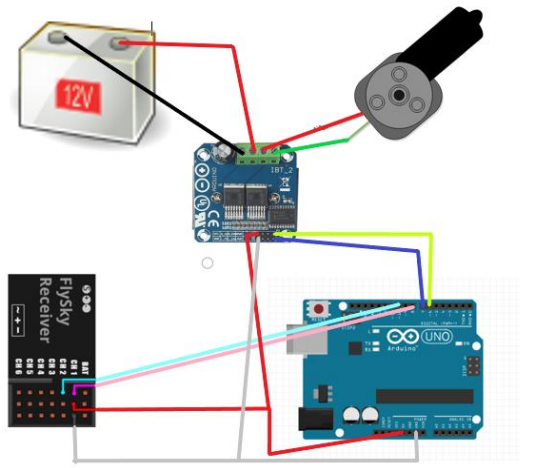


Fig-1: Circuit diagram for the motor connection

2.2 COMPONENTS USED

2.2.1 ARDUINO

Arduino Uno It is a microcontroller board dependent on ATmega328 which has 14 computerized I/O and 6 simple pins. It has everything that is expected to help the microcontroller. Just associate it to the PC with a USB link to begin with the Arduino Uno board. It is adaptable, simple to utilize equipment and programming. Arduino Uno can detect nature by accepting contribution from an assortment of sensors and can influence its environmental factors by controlling lights, engines, and different actuators.

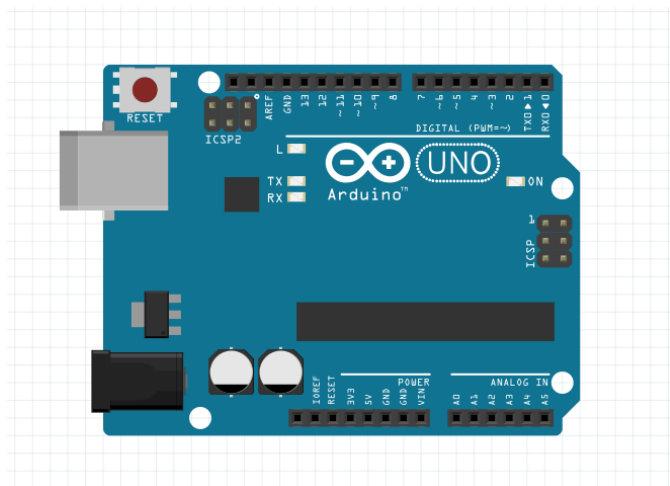


Fig-2: Arduino

2.2.2 IBT MOTOR DRIVER

High current 50A. Features: This is a MOSFET high current (50A) H-bridge driver module. With the microcontroller PWM signal isolation, effectively protect microcontroller. To achieve the motor forward and reverse rotation, two PWM input maximum 200kHz frequency.

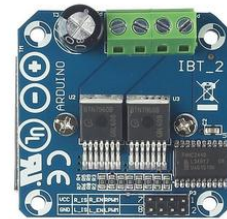


Fig-3: IBT motor driver

2.2.3 DC MOTOR

DC motor is utilized for the transformation of direct current into mechanical movement. The mechanical movement could be revolving or direct. The activity of the DC motor depends on the rule that when a current-conveying conductor is set in an attractive field, the conductor encounters a mechanical power. The speed of a DC motor can be constrained by changing the voltage applied to the armature or by changing the field current. DC motor can be utilized for the development of the automated vehicle. In this case we are using wiper motor which are generally used in cars and trucks for the wiper. These motors are highly recommended as this has a huge use in the industry and it also provide the best torque for the required project.

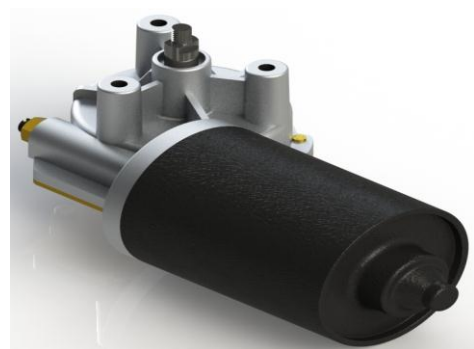


Fig-4: wiper motor

2.2.4 BATTERY

A battery is a gadget comprising of at least one electrochemical cell. A battery is a gadget that straightforwardly changes over compound vitality to the electrical vitality. The reason for the battery is to flexibly 12 volts to work DC engines. We can get this type of battery easily in the shops.



Fig-5: 12V dc battery

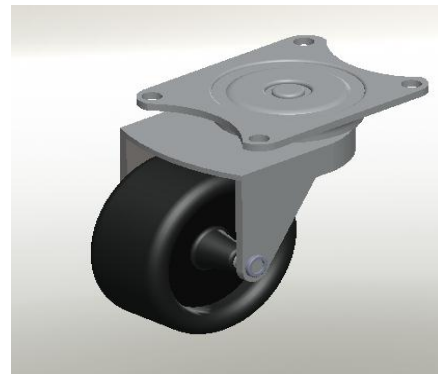


Fig 7: castor wheel

2.2.5 RF Transmitter & Receiver

The transmitter unit shows the general square graph of the transmitter unit of the undertaking. DC motor is interfaced with a microcontroller. Contribution from a remote camera mounted on a robot is given to the controller also. Yield gadgets are LCD show and RR transmitter. On the showcase, orders are shown like forward, opposite, left and right likewise middle of the road esteem from the sensors can likewise be printed. All the data is communicated on 2.4GHz recurrence remotely. Produced values signal is completely encoded and there is no block attempt of some other electromagnetic sign the recipient part of RF module gets transmitted signals in synchronization. These approaching signs are simple in nature. These are changed over into computerized in microcontroller itself. Guidelines are handled and yield signals are given to engine driver, by the yield of which the motor activities take place. IBT motor driver gives 12V sign to help in speed though just controlling is finished by controller's 5V flexibly. The two units are controlled by 12V directed gracefully. ATMEGA 16 is a major canny piece of the entire gets together close by a presentation is utilized to show the status of the robot.

2.2.7 NYLON WHEELS

Nylon wheel being used is of 100mm diameter and 40mm width. Mainly used for the industrial purpose.

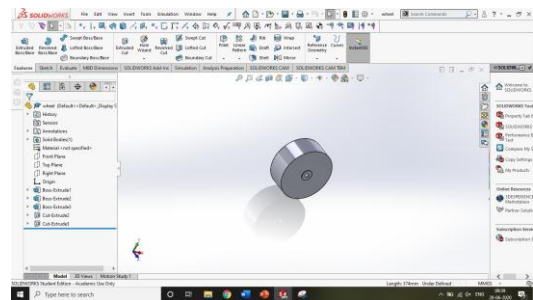


Fig-8: Nylon wheel

2.2.8 CHASSIS

The chassis made will be completely made of mild steel, welded and bolted properly



Fig-6: RF Transmitter & Receiver

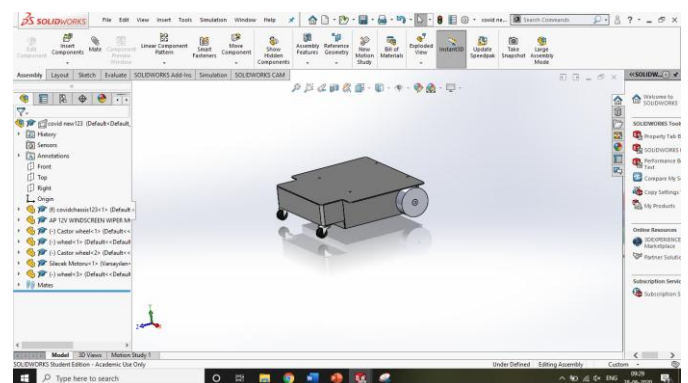


Fig-9: chassis

2.2.6 CASTOR WHEEL

The castor wheel being used are generally used for industrial purpose. And are commonly available in the markets.

2.2.9 CHASSIS MODIFICATION

Here is chassis modification on how can we add multiple cases on the main chassis with respect to the things to be transported to the patients

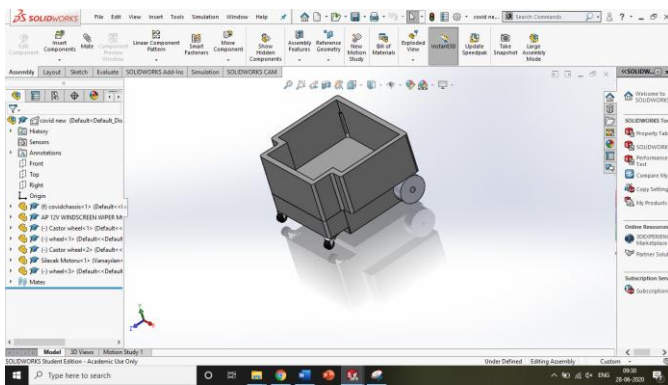


Fig-10: modified chassis 1

In the above chassis medicines and others can be transported from may be the medicine shop to the patients or the doctors.

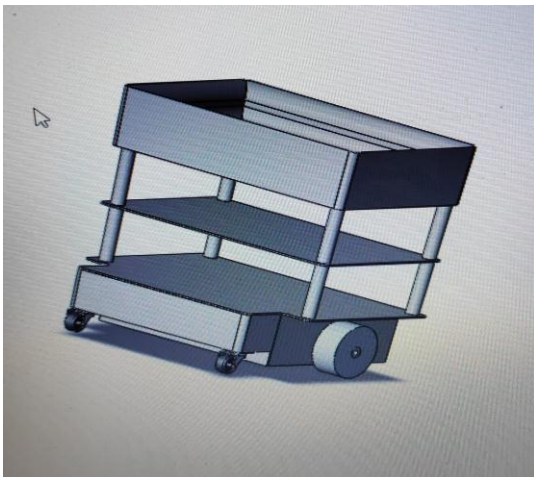


Fig-11: Modified chassis 2

In this particular chassis many other items like food, water and medicines can easily be transported to the patients. Without any physical contact with the patients.

3. CONCLUSIONS

This plan includes the huge utilization of these days accessible trendsetting innovation in the field of installed hardware and unguided correspondence with the most noteworthy level of security and straightforwardness in applications. The matter of fascination of this undertaking is that it gives a brilliant measure of advantages in a financially savvy way. It gives the encryption in correspondence, transmits the video signals at higher information rates. The range indicated is sufficiently noteworthy to evaluate the model alongside the continuous application it has. Another investigate about this plan is that its quick reaction. Also this helps all the technical to know about various types of motors, microcontroller and their usage in this necessary situations. The task is all around figured out how to react to the sensor activities inside seconds and produce an alive

picture on the showcase gadget simultaneously. Building up the model of this pandemic robot is joining the accompanying highlights like issue free control, more prominent inclusion for the handset, cost-adequacy, spying robot abilities, speedier time reaction with future extension arrangement.

REFERENCES

- [1] Connections
“<https://forum.arduino.cc/index.php?topic=507832.0>”
- [2] English catalogue on DC Geared motor by TSUKASA
- [3] RIOBOTZ combot tutorial ,version 2.0, march 2009

BIOGRAPHIES



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