" CORONA WARRIOR ROBOT "

Prof. H. B. Wagh
Assistant Professor
Mr. Ahire Shubham Narayan B.E Student
Mr. Amol Gorakshanath Purkar BE Student
Mr. Ashish Vivek Hiwarkar BE Student

Department of Mechanical Engineering
Matoshri College of Engineering And Research Center, Nashik.

ABSTRACT:
Automation is a need of time. Automation makes task easier and reliable. The advancement in the technology has brought a revolutionary change in the field of robotics especially in automation sector. Robot is a reprogrammable, multifunctional gadget which is basically intended to work like human being, for example, pick and place an object, stacking and emptying, observation, social insurance, and widely used in modern and aviation application. Robots can perform in hazardous environment and possesses precise work to build the profitability as it can work 24 hours without rest.

Keywords: Iot, robotics, robotics, corona, covid19

INTRODUCTION

The Internet of Things (IoT) and robotics communities have so far been driven by different yet highly complementary objectives, the first focused on supporting information services for pervasive sensing, tracking and monitoring; the latter on producing action, interaction and autonomous behaviour. Development of new laboratory prototypes of intelligent service robots, intended for applications in indoor environment, was designated as one of the main project objectivesFor this reason, it is increasingly claimed that the creation of an internet of robotic things (IoT) combining the results from the two communities will bring a strong added value. The main objective of this project is to fabricate a robotic trolley for material handling in industries. The trolley controlled by a microcontroller module unit. It can stop, turn right, turn left, forward and backward. It can follow wherever they go, during they were in range.The designed robot can be easily controlled by sending the commands to the micro controller from anywhere from the world. These commands can be observed by using Attention commands and acceptable action is taken.

In this project, we will mainly focus on the issues of patients as well as safety and security, specifically the effect of medical device regulation and data protection laws on robots in healthcare. To overcome the issues like direct contact with patients in Covid-19 wards, we will develop a robot i.e., corona warrior robot which will be used to provide medicines to patients and sanitize the person when any person comes in front of the robot.Artificial intelligence technique is used in this system. Proximity sensor is used to sensor the obstacle and stop robot automatically.

Problem Statement:

Now-a-days, in the period of Covid-19, corona virus is spreading basically through the direct contact as it is infectious disease. In hospitals, doctor and nurses get direct contact with the active corona patients, thus there are more chances of spreading the virus in huge amount. To have control over this, we can develop a robot which will be on duty in replacement of nurses and will provide all essentials such as medicine, fruits, etc. to patients

Objectives:

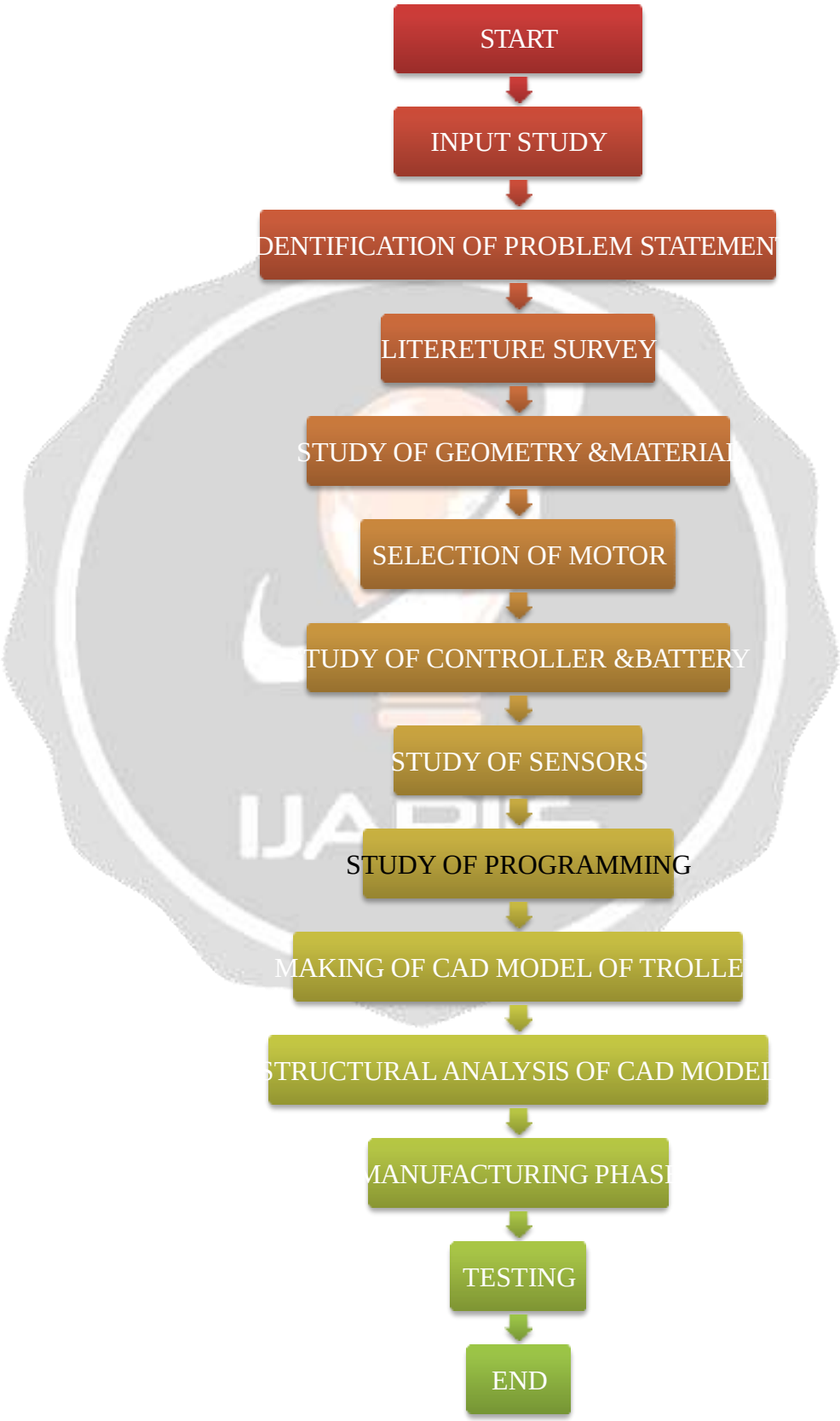
1. To design and build a corona warrior robot which will help doctors and nurses to avoid direct-contact with corona patient in the hospital.
2. To maintain health security.
3. To spray maintain social distancing
4. To visually inspect the hospital wards wherever patients are admitted.

Scope of the Project:

1. Weight lifting capacity of the robot can be increased by -
• increasing overall size of the chassis
• using supporting stand with height
• choosing more width of wheels
2. To save human life by avoiding Direct-contact with corona patient
3. To minimize the energy consumption.

4. Space occupation will be less.

Methodology:



LITERATURE REVIEW

1. **Cheng Siong Lim &etal (Faculty of Electrical Engineering, University Teknologi Malaysia)** suggested in their research paper "Automatic Human Guided Shopping Trolley with Smart Shopping System" that A shopping trolley is a necessary tool for shopping in supermarkets or grocery stores. Therefore, an automatic human and line following shopping trolley with a smart shopping system is developed to solve these problems. A line following portable robot is installed under the trolley to lead the users to the items' location that they plan to purchase in the supermarket. The robot can carry heavy loads for people in hospitals, airports and shopping centers. The robot can provide services to humans as an assistant in different kinds of situations. The paper presented the hardware and software design of the portable robot & the result of the testing on the used sensors like ultrasonic and line sensors. They highlighted the research background on the problems 3 related to shopping trolleys. They explained in detail both the hardware and software design for the developed portable robot. The software design approach in this project involved the Intel board DE2i-150 as a database server and Java programming language based Android application as a client. The main algorithm of the software design for the client is to utilize the Android application because the user interface has to organize the shopping list and to show the grocery items in the respective locations on the shopping map [2].
2. **Pieter Simoens, Mauro Dragone and Alessandro Saffiotti** had published a paper titled "The Internet of Robotic Things: A review of concept, added value and applications". In that they examined how the merger of robotic and Internet of Things technologies will advance the abilities of both the current Internet of Things and the current robotic systems, thus enabling the creation of new, potentially disruptive services. They discussed some of the new technological challenges created by this merger and concluded that a truly holistic view is needed but currently lacking. The Internet of Things (IoT) and robotics communities have so far been driven by different yet highly complementary objectives, the first focused on supporting information services for pervasive sensing, tracking and monitoring; the latter on producing action, interaction and autonomous behaviour. For this reason, it is increasingly claimed that the creation of an internet of robotic things (IoRT) combining the results from the two communities will bring a strong added value. They said that in this cyber-physical perspective of the IoRT, sensor and data analytics technologies from the IoT are used to give robots a wider situational awareness that leads to better task execution. They also explained various abilities of IOT like Perception ability, Manipulation ability, Motion ability, Decisional autonomy, Interaction ability, Cognitive ability, Configurability, Adaptability, Dependability briefly at different levels as basic ability, High level ability, Interaction ability and System level ability, etc.. Finally they concluded that Current IoRT incarnations are almost uniquely found in vertical application domains, notably AAL, 4 precision agriculture and Industry 4.0. Their conviction was the IoRT should go beyond the readings of 'IoT-aided robots' or 'Robot-enhanced IoT

3. **G. BalaKrishnan&etal (Students and Professors from Department of Automobile Engineering, Bist, Biher, Bharath University, Chennai)** described in the research paper "Design and Fabrication of Robotic Trolley for Material Handling", that it is very much economical and help full to many industries, hospitals and workshops. This work had also reduced the cost involved in the concern and also it had been designed to perform the entire requirement task which had also been provided. They briefly gave the working Principle, Merits & Demerits, Components that used, Design and Calculations. They said that a robotic vehicle is fabricated which runs like a car by carrying tools from place to another. The motor is connected with the wheel arrangement with the help of speed reduction gear box. When the trolley is loaded with a tool or some other goods it can be easily move to the place as per need by means of wireless remote controller. They also studied the cost as the direct cost of material handling cannot be measured, the main factor attributing to material handling costs are wasted time. An idle machine operate essentially being paid while not producing value and the second main cost associated with material handling is labour costs. The transportation of the materials is essential, but it does not directly add to the finished product

5. **Nek a Dodi Suryanto (Faculty of Technology and Computer Science, Universitas Prima Indonesia.)** had published the paper titled "Design of automatic mobile trolley using ultrasonic sensors". They designed an automatic mobile trolley using ultrasonic sensors of type HCSRF04 which had applied the principle of 'time of flight' (TOF) to measure distance, which computed the travel time of ultrasonic echo reflected from the target, and it detects the distance as well as the direction of user movement and location. They proposed that an automatic mobile trolley was a prototype of wheel robot that serves as a trolley or shopping cart. It did not need to be encouraged or withdrawn. It would make an easier shopping for people as customers. The trolley controlled by a microcontroller module unit. It can stop, turn right, turn left, forward and backward. It can follow wherever they go, during they were in range. It had been need a trolley that can follow automatically human movement. The direction could be detected using transducers, sensors or other detector. They divided

design into several parts namely the design of hardware, hardware relationships, the initialization of sensors and auxiliaries, and software design. The technology represents to retailers opportunity to reduce costs and to improve services, allowing to attend clients quickly, precisely and supplying personalised services. They used sensors to control 7 the distance and direction of user movement and location. They assumed that the user will walk in front of the trolley, so that the sensors will detect the user and follow them wherever they go. They had designed system in such a way that the trolley can move forward based on the distance data from the sensor results[5].

6. **SatyaRanjan Das, Santosh Kumar Behera, Mihir Narayan Mohanty[2019]** published a paper titled "IOT Based Fire Detection Robot". In this paper, the authors gave a project presenting a robot based on IOT having capability to detect and fight against fire in our houses, industries as well as offices where accessibility of human is not possible. The new and non-obviousness in this device is the robot which is free to move in the region of fire either in our homes or our offices where human's feasibility is not possible. This robot will fight against fire as well as harmful gases using Infrared sensor and gas sensor and when robot detects any fire or gas inside the building of any houses or offices it will fight with harmful gas using appropriate sensor and simultaneously sent the message to user by using SMS services or GPRS Packs. Robot is controlled by IOT server with the help of computers, laptop or mobile [6].

SYSTEM DEVELOPMENT

Design

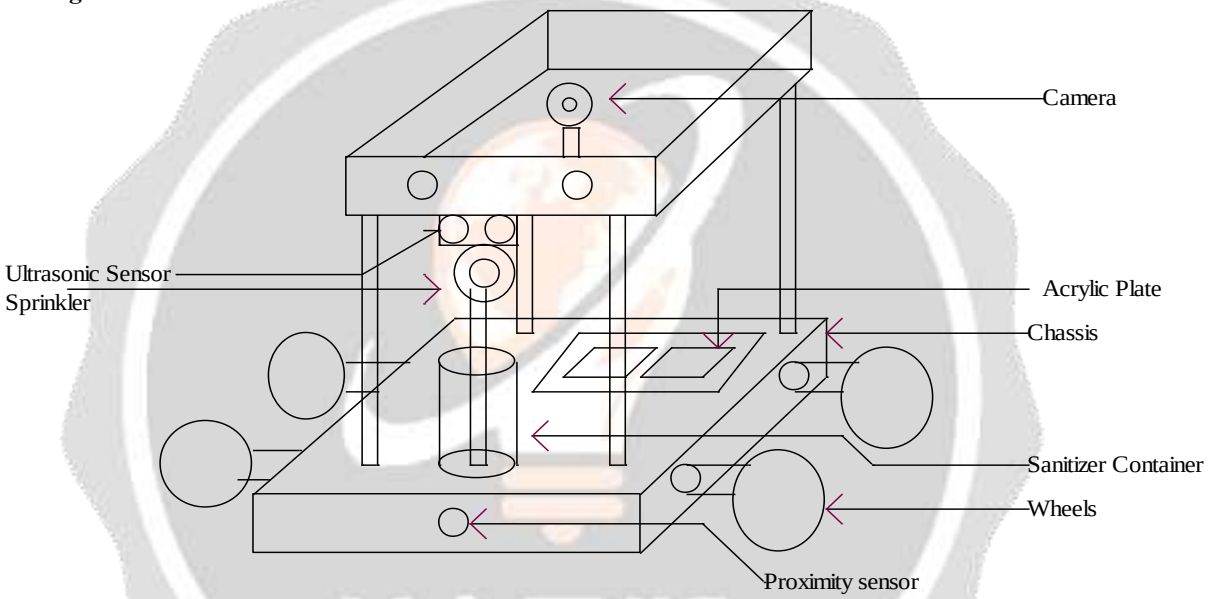


Fig : System Design

Firstly, we develop the Chassis in rectangle shape using the MS material. Thickness of material is 1 mm.As shown in the figure, it is clearly indicated the wheel position of shaft, the sensor position as well as the tray we providing. The tray placed on the top of the Robot will be used for putting the food, medicine and drinking water in it. The shape of tray is also rectangle. We will provide a stand using the square pipe which also supports to the tray. The material of pipe is also MS. For motor wheel, diameter of the wheel is 10 centimetre and the material of wheel is PVC and Outer body's material is rubber for gripping the surface. We use a 10 kg torque motor for or carrying the heavy load. The Motor RPM is 60 revolutions per minute and it requires 200 mAmp current and it operates on 12 volt DC voltage. For circuitry, the place ofChassis basically be on bottom side also we provide two eyes to the robot with the help of LED.

Fig: Our Design and ready Model

TESTING & VALIDATION

TESTING & TROUBLE SHOOTING:

TESTING:

Testing is nothing but the physical checking of the all components and all possible condition to avoid problem in the circuit functioning.

Testing done with so many checking instruments as per the circuit requirement and conditions.

BARE BOARD TESTING:

In bare board testing we should have to check the following points

- Continuity of the track
- Over etching or under etching if any
- Shorts if any
- VCC and GND tracks

TROUBLE SHOOTING:

After the PCB is prepared the conductivity test is carried out. First pin-to-pin conductivity is checked. The necessary IC interconnections are also checked. The resistance value of all the resistor are checked and then completed with the value denoted by color-coding is done.

The capacitors are also checked to see whether they are working or short or open. The diodes are tossed for priority. The diodes are cracked for their forward resistance and reverse resistance. After carrying out all the possible testing, the jumper wires are also tested for conductivity.

Expected Outcomes:

1. Secure and enhancedsystem.

2. Delivers essentials topatients.

3. Direct contact with corona patient isavoided.
4. Wireless remote controloperation.
5. Compactdesign.
6. Battery life expectancy- OneYear
7. Automaticsanitizationwheneverpatienttouchestheessentialsplaced inthetrayof robot.
8. Using Proximity sensor, obstacle is sensed and robot will stop at thatmoment.

REFERENCES

[1] AleksandarRodića,n, MilošJovanovića, IlijaStevanovića, BrankoKaranb, VeljkoPotkonjakcMihajlo Pupin Institute, University of Belgrade,Volgina15,11060Belgrade,Serbia Institute of Technical Sciences, Serbian Academy of Sciences and Arts, Knez Mihajlova35,11000 Belgrade, Serbia School of Electrical Engineering, University of Belgrade, BulevarKralja Aleksandra73,11000Belgrade, Serbia "Building technology platform aimed to develop service robot with embedded personality and enhanced communication with social environment" https://www.sciencedirect.com/science/article/pii/S2352864815000127 March 2015.

[2] Cheng Siong Lim, Michael LoongPeng Tan, Kumeresan A. Danapalasingam, Chee Wei Tan Faculty of Electrical Engineering, UniversitiTeknologi Malaysia "Automatic Human Guided Shopping Trolley with Smart Shopping System" https://www.researchgate.net/publication/275222428_Automatic_Human_ Guided_Shopping_Trolley_with_Smart_Shopping_System March 2015.

[3] Pieter Simoens , Mauro Dragone and Alessandro Saffiotti "The Internet of Robotic Things: A review of concept, added value and applications" 10 https://journals.sagepub.com/doi/full/10.1177/1729881418759424 International Journal of Advanced Robotic Systems January-February 2018:

[4] G. BalaKrishnan1, D Mohan Kumar2, C. Jagadeesh Vikram3, P.NaveenchandranM.Tech student, Assistant Professor, Professor , Department of Automobile Engineering, BIST,BIHER, Bharath University, Chennai "Design And Fabrication Of Robotic Trolley For Material Handling" https://acadpubl.eu/hub/2018-119-12/articles/4/907.pdf International Journal of Pure and Applied Mathematics ISSN: 1314-3395 2018.

[5] EkaDodiSuryanto*, Hendrik Siagian, DespaleriPerangin-Angin, RahayuSashanti, SuthesYogen Faculty of Technology and Computer Science, Universitas Prima Indonesia. "Design of automatic mobile trolley using ultrasonic sensors" https://iopscience.iop.org/article/10.1088/1742- 6596/1007/1/012058/pdf Journal of Physics 2018.

[6] SatyaRanjan Das, Santosh Kumar Behera, Mihir Narayan Mohanty," IOT Based Fire Detection Robot", International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue-11S, September 2019