BansilalRamnathAgarwal Charitable Trust’s

Vishwakarma Institute of Information Technology

*(Department of Electronics & Telecommunication)*

**

*A*

*Project entitled*

*“Smart Wireless controlled Pick N Place Line Following Robot****”***

*Submitted by*

Arpit Shrivastava (T150393199)

Durgesh Vitore (T150393219)

Tejas Shinde (T150393196)

Employability Skills and Mini Project

T.E. Electronics & Tele-Communication

*of*

*University of Pune*

*Under the supervision of*

**(Dr.S.R.Joshi)**

*Year 2018 – 2019*

BansilalRamnathAgarwal Charitable Trust’s

Vishwakarma Institute of Information Technology

*(Department of Electronics & Telecommunication)*

**CERTIFICATE**

This is to certify that the project “**Smart Wireless Controlled Pick N Place Line following Robot”** has been successfully completed by

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| --- | --- | --- | --- | --- |
|  |  | Arpit Shrivastava |  |  |
|  |  | Durgesh Vitore |  |  |
|  |  | Tejas Shinde |  |  |

It is a work done by the students and has not been submitted previously by any other student/students.

The work is done, on the basis of the work allotted to these students, based on various Project ideas presented by them.

This project report is being submitted as a part of the subject Mini Project and Seminar at T.E.-E&TC

(Dr.S.R.Joshi) (Dr.S.V.Kulkarni)

Project Guide H.O.D- E& TC

### ACKNOWLEDGEMENT

The ‘Smart Wireless Pick and Place Robot’ designed and develop by us is a small effort in taking a step towards automation in day to day life things.

At first we would like to exoress our sincere gratitude to our project guide Dr.S.R.Joshi for Motivating us to implement such idea and also keeping us on track throughout the project by providing constant guidance and all the support we required to complete the project.

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We are also thankful to entire teaching and non-teaching staff of the electronics and Telecommunication Department.

Last but not the least we would like to thank each and every person who helped us direcly or indirectly to complete this project.

Arpit Shrivastava

Durgesh Vitore

Tejas Shinde

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**NOTICE**

Project Report format for T.E. E&TC students

Students should prepare the report using the following guidelines. Projectreports should be prepared in the spiral boundvolumes. While preparing the reports, they should keep page margin as below:

**Top & bottom margin of the page: 1 inch each**

**Spacing between the lines: 1.5**

**Left margin of the page: 1.5 inch**

**Right margin of the page: 1 inch**

Font size should be 12 normal in ‘Times New Roman’ for body text. For heading and subheading font size 14 and 12 (all capital and bold), respectively should be used. For footnotes and captions of the figures, font size 10 should be used. Italic or any other style can be used at appropriate places wherever required. Text should be typed by keeping one and half space only. Sufficient spacing should be given (probably double) while writing headings / titles etc. but Only limited number of datasheets of important IC’s should be included at the end of the report as appendix. Preface or acknowledgment should be included at the starting of each copy of the report and must be signed with date by every student.

1. **INTRODUCTION:**

Mankind has always struggled to find alternatives for himself to work in hostile zones and carry out his orders. The popular concept for this is robot which is machine that performs specific task according to orders given to it.

The modern industry is moving from automation towards “Robotization” to maintain product quality and increase productivity. Today’s robots do not look like human being but research is going on to provide more and more anthropomorphic structure and human capabilities in these.

Here how a pick and place robot can be designed for industries where store rooms are to be managed or loading and packing is to be done. Various problems and obstructions are taken into consideration and analysed taken into consideration while designing the robot.

1.1 **AIM AND OBJECTIVE:**

The main objective of pick and place robot is picking the object form source location and place it to desired destination. The mechanical arm is arrangement made for picking and placing the object. For detection purpose proximity sensors are used.

The robot is made of three sections. The top gripper unit is to pick and place any object. The bottom driving unit is to move the object to location specified by user. And control unit which will control the operation of whole system.

In Short, this project is to design an autonomous robot with complete system that allow the robot to identify predefined locations and interact with desired object.

1.2 **IMPORTANCE:**

In today’s scenario, the industry having a problem by human life in some hazardous duty service. Robots can work in hazardous environments where unprotected human would quickly die.

1. **BACKGROUND:**

Automation as a technology is concerned with the use of mechanical, electrical, electronic and computer-based control systems to replace human beings with machines, not only for physical work but also for the development of information processing. Industrial automation, which started in the eighteenth century as fixed automation has transformed into flexible and programmable automation in the last 15 or 20 years. Computer numerically controlled machine tools, transfer and assembly lines are some examples in this category

Scientific interpretation of science fiction scenario propounds a robot as an automatic machine that is able to interact with and modify the environment in which it operates. Therefore, it is essential to define what constitutes a robot. Different definitions from diverse sources are available for a robot.

Three laws of Robotics:

1. A robot should not injure a human being or, through inaction, allow a human to be harmed.

2. A robot must obey orders given by humans except when that conflicts with the First Law.

3. A robot must protect its own existence unless that conflicts with the First or Second law.

For our project we decided to make a pick and place robot. Through the literature survey we found basic principles of pick and place robots and many associated problems that are needed to be solved.

Optimization of these robots is still very important field. main specifications of pick and place robors are speed of operation, precision, maximum load,range of motion and cost.

**2.1** **INTERNET SEARCH**

Our internet search found out the wide range of applications for pick and place robots. There are too many websites as well as YouTube videos that guide about the actual robot build,full instructions for how to build a simple robot.

It features parts lists including type of motors, battery, modules, specifications and more.

The useful part of this search includes power supply, motor, and microcontroller details. By looking how the build is made, we can modify and expand the project.

1. **BLOCK DIAGRAM:**

**Battery Source**

**3S-1P**

(O/P: 4.2V [max], 2.2A)/cell

To: Motor driver

**IR Receiver**

(I/P: 5V, 20mA)

**IR Receiver Array**

(I/P: 5V, 100mA)

**ATMEGA 328P**

**-PU**

(I/P: 7-12V, 250mA)

**Motor Driver**

(I/P: 12V, )

**Motor ( 2 )**

(I/P: 0-12V, 150-650mA)

**Mobile**

**GUI**

**Window**

**Wireless Module (HC09)**

(I/P: 5V, 250mA)

**Servo Motor**

(I/P: 5V,550mA)

**Arm Gripper Mechanism**

* Input and output devices: Wireless Module, Infrared Sensors, Motor Driver, Servo Motors.
* Input device: Mobile app Bluetooth terminal.
* Mechanical devices: Gripper, Chassis.

1. **ELECTRONIC AND HARDWARE DESIGN ASPECTS:**