

FLEXIBLE ROBOT USING AUTOMATED OBJECT SENSING AND SERVING WITH GRIPPER MECHANISM

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ABSTRACT

Most robots today are used to do repetitive actions or jobs considered too dangerous for humans, A robot is ideal for going into a building that has a possible danger and are also used in factories to build things like cars, candy bars, and electronics systems, The Flexible serving Robotic System gives people the ability to access in all locations that were previously difficult or impossible to reach. And because it is affordable and efficient, the this Robotic System allows users to expand their service because they serve and improve the probability of their facilities in all locations including locations where human cannot access this also helps the disabled person to lift or place a object from one place to another. The Flexible serving Robotic System can navigate a nearly 180 degree path to reach challenging locations this module is fast flexible and also safe to handle.

KEY WORD: Object detection, Identifying locations, gripper actions, motion of robot

1. INTRODUCTION:

In this world people were not blessed with all the abilities that a common human have, this problem of having disability in the physical body can also lead to several depression stages and mental disorders, not only the disabled or physically challenged persons many people also who were tend to get normal physical conditions also need some relaxed work to attain this we had developed a module which makes the work easier and also helps the physically challenged persons to do certain work as a normal person this module can be operated through remote control so there is no problem of lifting heavy loads hence less human power is needed for operating the remote controller and also this project can be automated by selecting the pick and place locations whereas automating programs need skilled personnel so we have attached remote controller unit for easy operation.

Not only for easy operation this robot can carry objects without any hesitations and it follows the rules as we need. Unless human beings robots were always trust worthy once a programmer uploads a program for specific operation to carry objects from one desired position to another desired position. The same operation is repeated until the program is changed or reprogrammed by the programmer. Because of its wider applications it is used in work places also to carry or move objects from one places to another places.

The hardware of the robot is based on the needs like which object to be carried, weight of the object to be carried, shape of the object to be carried. Here we used grippers to hold objects weighing 250grms approximately. And it is programmed to carry objects within a small limit of area and RC control is established until the reach of the controller.

Hope this robot has wider applications to help physically disabled peoples and also to reduce man power in work places and also helps to work on risk places too.

COMPONENTS USED:

| COMPONENTS | QUANTITY |
|------------------|----------|
| ARDUINO (UNO) | 1 |
| GRIPPER | 2 |
| MOTOR DRIVERS | 4 |
| Battery | AS REQ |
| PALLET | 1 |
| CONNECTING WIRES | AS REQ |

ARDUINO:

Arduino is an open-source electronics 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 and Arduino software, based on processing

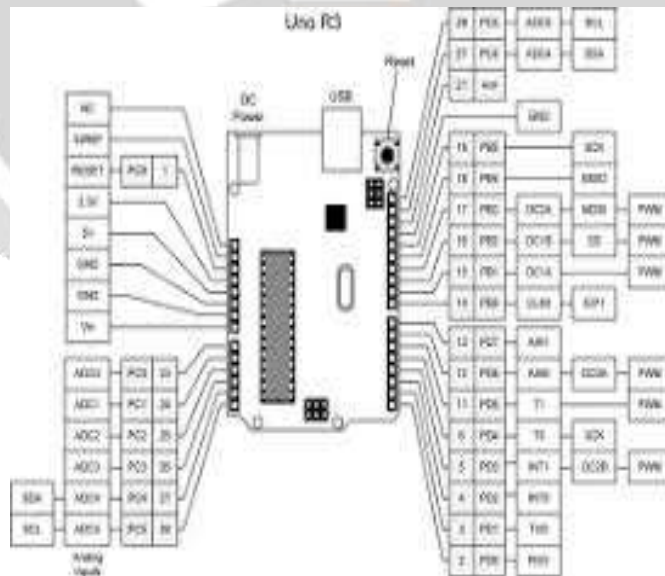


Fig-1: Arduino pin configuration

The Arduino UNO is a microcontroller board based on the ATmega328 It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. Arduino is an open-source electronics 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 message

– and turning it into an output activating a motor or an LED, publishing something online. A program for Arduino may be written in any programming language with compilers that produce binary machine code for the target processor. Atmel provides a development environment for their microcontrollers, AVR Studio and the newer Atmel Studio.

The Arduino project provides the Arduino integrated development environment (IDE), which is a cross platform application written in the programming language java. It originated from the IDE for the language processing and wiring. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic identifying brace matching, and provides simple one click mechanisms to compile and upload programs to an Arduino board. It also contains a message area, a text console, a toolbar with buttons for common functions and a hierarchy of operation menus.

Arduino Uno R3 Pinout

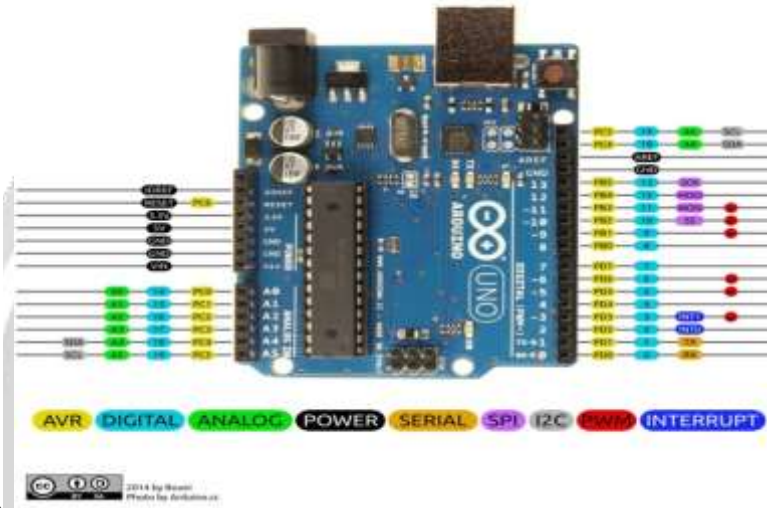


Fig-2: Arduino Uno R3

MOTORS:

A motor is a rotary electrical device which converts electrical energy into mechanical energy. This works in locomotion part of this robot.

MOTOR DRIVER:

It is a diode rectifier which supplies field to the motor. It is also known as thyristor. it is an independent device that works separately.

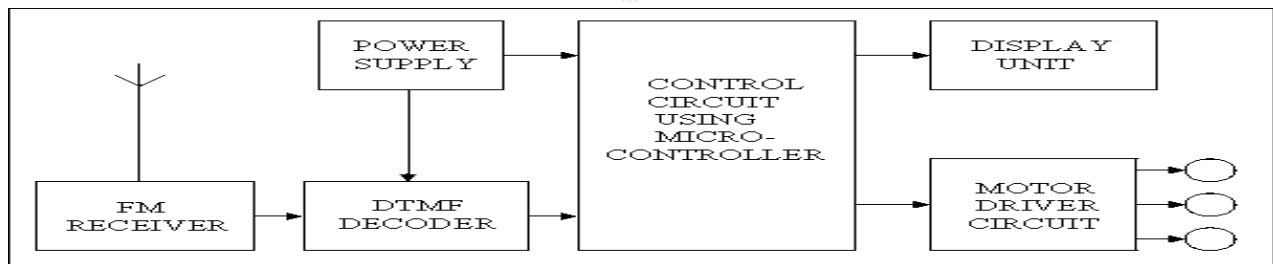


Chart-1: flow chart for circuit control

REMOTE CONTROL:

It is an electrical device which is used to operate another electrical device from a certain distance.

GRIPPERS:

Robot grippers are the physical interface between a robot arm and the work piece. This end-of-arm tooling (EOAT) is one of the most important parts of the robot. One of the many benefits of material handling robots is the reduction of part damage. A gripper comes in direct contact with your product, so it's important to choose the right type of gripper for your operation.



Fig-3: Gripper

WORKING:

It is a small robot programmed to move objects with in a small distance. After the programmer uploads the program the robot checks the destination of the object to be picked and then it moves towards the destination point and picks the object after this the robot carries the object to the desired position as uploaded by the programmer

APPLICATIONS:

This is a simple structure which suits home and office works. It could be very helpful for the physically disabled peoples. With the help of the robot one can take the objects from nearby areas by himself .it also helps in offices for carrying objects from one place to another.

CONCLUSION:

With this help of this robot the work for the aged people and physically disabled people becomes very easier. The robot can be reprogrammed when needed. By the continuous usage the parts would get damaged which were also easily replaceable. I hope this robot would be used in all the areas in future.

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