Arduino Based Robotic Arm For Automation

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Abstract- *The aim as to this project is the current arm as to the robot powered by Arduino Uno. The shiftment is done by two servo motors. The robot arm is as totemutilize in industrial environments to reduce workload. This project incorporates a unique robot arm design at low cost. The robot arm is utiliz by the mobile app to control the robot arm easily. The robot arm is robotic machine, in the general run as to things programmed, including functions indistinguishable to a living person's arm. Interconnected to correspondent a manipulator is coupled by links that allow for rotating shiftment or translation removal. Manipulator connectors can be take account as to a kinematic chain. The commercial end as to the kinematic series as to manipulator is called end effectors and is similar to the living person's hand. Final effectors can be designed to perform any wanted function correspondent as Drilling. Gripping. Packaging.cte depending on the application. The arms as to robots can be controlled or manually controlled and can be utilize to pull as various functions with considerable perfection.*

Keywords- Arduino Uno, Servo Motor, Automation, Robotic Arm, Bluetooth Chip

I. INTRODUCTION

This Robotics is a branch as to Engineering Science & Technology related to robots, as well as its design, production, operation, and structure structure. Electronic robotics, mechanics,& soft ware robots experimentation nowadays focuses on developing structure that show adaptability, flexibility, duplication, error tolerance, standard and flexible soft ware environment and seamless communication with other devices, in the arm as to the robot, while a great number try to strengthen the ground as to analysis where many fundamental hypothesis in robots are fabricated on it. In this fast-growing industrial era, every industrial unit needs speed in production. Robots have found widespread use in industry. It is a machine that works in the same way as the living person's arm, along different attachments that shift in axis or revolve in a definite direction. Connect PIN servo motors data to 8 & 9 Arduino digital pins. They are as totem organized and utilized to perform specific tasks, typically, production, manufacturing and industrial applications. The robot arm was originally designed to assist in mass production, which is very popular in the production department. In addition, the robotic set up can be customized or customized according to needs and budget. Robotics is a branch as to engineering and science that combines Electronics engineering, mechanical engineering and computer science. The robotic automation set ups are ideal for this, as they can operate independently or be integrated to form function cells. The purpose as to this is to provide a robotic arm that operates effigently and effectively. The living person's body is a complete set up, made into robots. The living person's body should always encourage robotic builders. The arm as to the robot we are making can shift in the two automatic and negative (X) &(Y) axis 2-D with the help as to two servo motors. We use the slider provided with in the app to provide instructions. We can control the course of a servo motor through out it. Install either one of the two servo motors on the other using accessories or you can use a cuts of the as to cardboard so that the two can travel easily wherever you go. It is important to design and develop automated testing algorithm to reduce hand jitter. Robots utilized to test precise shiftiest and sass tot ware, Here the selection and position robot is a servo motor &mechanical & electrical working set up that identifies the object of the exercise, lifts up the object of the exercise in the starting point area &positions in the wanted position. In order to obtain an object of the exercise, an object of the exercise detection set up is utilized in the reception set up provided by the set up & object of the exercise.

II. LITERATURE REVIEW

The robot arm is a type as to arm that is flexible, usually flexible, with functions similar to a living person's arm. Types as to robotic arms depend on their distance, the working capacity and access as to the Cartesian robot utilized to select and locate, design and manage heat. Its main range is a 2-dimensionalcylindrical robot also utilized for the upwards of mentioned functional classification, but as it be in charge of in the cylindrical integration set up , it can be utilized to perform tasks more accurately and precisely, moreover and has a wider range, accessible range. The circularrobot operates in a diametrically opposed coordinate set up, the SCRA robot is mainly utilized for choice &position. It must be aligned with rotating joints to provide flexibility in flight. Then in a three

dimensional approach it is as totem combined with other methods a compact robot has three rotating parts. Compatible robots utilized on a mobile platform that handles cockpit flightsimulations. The robot has arms that are parallel or prism-shaped. Anthropomorphic robot This is similar to the living person's hand, which has independent fingers and thumbs.

III. METHODOLOGY

To carry out the project, i.e. manufacturing the robotic arm, we followed the methodology. Initially, we decided on how much weight the arm would handle. By choosing the weight to handle, we buy the motor of the couple. The second criterion chosen concerns the distance an arm can travel. The distance traveled by the arms must be calculated and programmed similarly.

The next step to be taken is the size of the attachment links. We have discovered that the right link length can work well with available engines. Then we calculate the torque that a motor can transmit. The motor supports the movement of the links according to the program

The next trick is to buy the materials needed to build the robot arm So first we buy the motor with the required torque. Aluminum links that attach to the base and clamp are available at the metal store. Arduino, circuits and leads are purchased from electronics stores. The end effect is one of the most complex parts of the system and as a result, it is much easier and cheaper to use commercial equipment than to build. This is the typical workspace of a five-degree-of-freedom (5 DOF) robotic arm. The mechanical design is limited to 5 DOF mainly because such a design allows most of the required movement and keeps the cost and complexity of the robot competitive. The joints of the robot arm are usually operated by electric motors. Servo motors were chosen because they include auto encoders that provide feedback to the motor and adjust the position accordingly. Photographs:
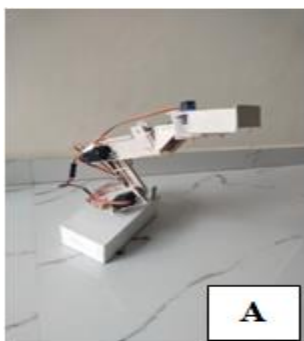

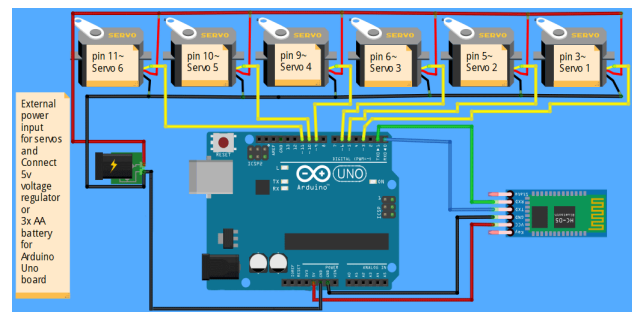Fig: robotic arm model

Fig : internals as to robotic arm

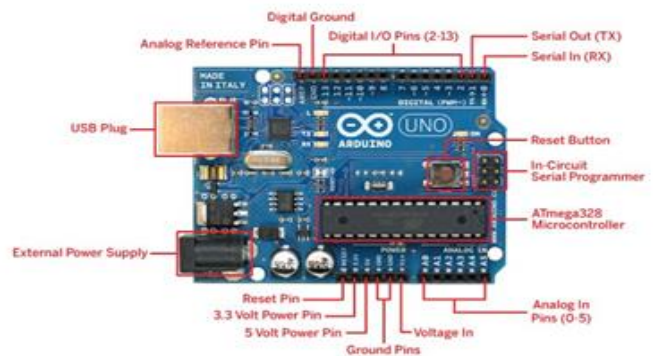Fig. : Circuit diagram

1) ARDUINO:

Table. 1. Detailas to Aurdino

Sr.no	particulars	details
1	MCU	ATmega328
2	Working voltage	5 V
3	Input voltage	7-12 V
4	Input voltage limit	6-20 V
5	Digital I/O pins	6
6	Wpm pins	6
7	Analog pins	6
8	DC current per I/O pin	20 mA
9	Length	68.6 mm
10	Width	53.4 mm
11	Weight	25 grams

Anduino Uno is a MCU Chip established on ATmega328. It has 14 input/output pins, 6 analog input. 16 MHz quartz crystal, USB attachment, power port and reset Switch. It contains every single thing you need to reinforce a small controller, just attach it to a computer with a USB cable or to provide electricity it with an Alternating current to Direct current converter or battery to get started. You can process with your UNO without worrying too much about doing something wrong, in the if chip burns you can change the chip and restart.

2) SERVO MOTOR (SG-90):

Table. 2. Detailas to Servo Motor (SG – 90)

SR.NO	PARTICULARS	DETAIL
1	Weight	9 gram
2	Diamension	22.2x11.8x31 mm.
3	Stall torque	1.8 kgf.cm
4	Working speed	0.1 s/60 degree
5	Working voltage	4.8 v(~5 V)
6	Temperature range	0°C - 55°C

Serva den to the error response control utilized to correct set up performance, Sep or RC Servo Molars DC moram lined with servo precision angular control systan RC serve motors usually have a rotation limit from 90 to 180 Bet serve actors do not always revolve. trucation limited between fixed angles, Servos is utilized for good placement. They are inal in robot arms and legs, sensors and RC och as RCS3 SERVO MOTOR belicopters, planes and vehicles.

3)SERVO MOTOR (MG996R):

Table. 3. Detailas to Servo Motor (MG996R)

SR.NO	PARTICULARS	DETAIL
1)	weight	55 gram
2)	Diamension	40.7x19.7x42.9 mm approx
3)	Stall torque	9.4 kgf.cm(4.8V) ,11kgf.cm
4)	Working speed	0.17 s/60 degree
5)	Working voltage	4.8 v - 7.2v
6)	Temp. range	0°C - 55°C

4) HC-05 Bluetooth chip :

The HC-05 Bluetooth Chip is an convinient Bluetooth (Serial Port Protocol) chip, designed for see through serial setting. Its attachment is a serial attachment that creates it simple to communicate with the chip or PC

IV. RESULT AND DISCUSSION

We increase the accuracy on work piece. Optimize the robot's weight. Increase the speed. By this project we can reduce the living person's effort with less time and accurately without any interruptions. It also uses less space on workplace. We can use the robot to hold the work piece and drill it, because as to that the two robots work does only one robot.A force diagram used to calculate the load. Since the rest of the hinges have the same engine, calculations were made only for the joint with the greatest load. The motor can move the link without any problems. We took into account the engine weight of about 50g, excluding the engine weight of node B, because the calculation is only performed for the node

V. CONCLUSION

In this project we have made a robotic arm using Arduino Uno in which we have completely eliminated the part as to coding for automation using an android app for shiftment and recording as to shiftment as to robotic arm. Also, we have reduced the weight joints by 5 to 10% by meshing due to which the shiftmentas to robotic arm got efficient. From this project we can conclude that automation is the most important aspect of business in today's competitive world. The main point of this work was on design. and a coded robotic arm. The robotic arm is designed with three degrees of freedom and can precisely perform simple tasks such as handling light materials. The robotic arm is equipped with several servo motors that interact between the arms and perform arm movements. A microcontroller for controlling a servomotor that can change position

REFERENCES

[1] Roland Szabo, Aural Contented utilized sass tot ware which is not sufficient to use more cameras they can use only one camera because as to raspberry pi which ability is so poor to create that program on one core