International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.282

Cotton Harvesting Machine

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ABSTRACT: The primary goal of this research and development project is to develop an automatic pick and place robot for material handling systems. This automatic pick and place robot integrates object detection with the pick and place process whereby the detection of an object would power the object gripper kick starting the pick and place process. With the objective of creating a user friendly and affordable system, the developed model high significantly demonstrates the use of technology in material handling systems. There are many different types of pick and place systems. It include portable material handling systems, industrial manipulators .This pick and place robotic arm with wheel scan be easily moved from one place to another. A pick and place robot manipulator can be used to pick an object and place them in an orderly manner to get a final destination. A pick and place requires little operator and provides maximum output with efficiency. Cotton has been picked by hand for centuries.

KEYWORDS: Automation, Harvesting, Electrical Drives, Robotics

I. INTRODUCTION

Robotics is part of Today's communication. In today's world ROBOTICS is fast growing and interesting field. It is simplest way for latest technology modification. Now a day's communication is part of advancement of technology, so we decided to work on robotics field, and design something which will make human life simpler in day today aspect. Thus we are supporting this cause. Robotics is the branch of technology that deals with the design, construction, operation, structural disposition, manufactr9ure and application of robots and computer systems for their control, sensory feedback, and information processing. Obstacle detection and avoidance robots are intelligent robots which can perform desired tasks in unstructured environments by finding and overcoming obstacles in their way without continuous human guidance. In robotics, obstacle avoidance is the task of satisfying some control objective subject to non-intersection or non-collision position constraints. Normally obstacle avoidance is considered to be distinct from path planning in that one is usually implemented as a reactive control law while the other involves the pre-computation of an obstacle-free path which a controller will then guide a robot along. A practical real-time system for passive obstacle detection and avoidance is presented. Robot Sensors are essential components in creating autonomous robots as they are the only means for a robot to detect information about itself and its environment. As little as one sensor is needed by a robot, though increasing the number and variety of sensors tends increase the robot's ability to get a more thorough understanding of the world.

II. BLOCK DIAGRAM

The working of the cotton-picking robot is simple but the technology. It consists of wheels, motors, a robotic arm, a stereovision camera. The Arduino mega 2560 is programmed to operate the movement of the wheels, the robotic arm and the camera in such a way that it makes picking of cotton an easy job and the Bluetooth module, which is paired with the Smartphone for the operation of the robot, makes it easier. The stereovision camera, whose frequency can be adjusted using an antenna receiver, is connected to a laptop or a TV to discern where the cotton.
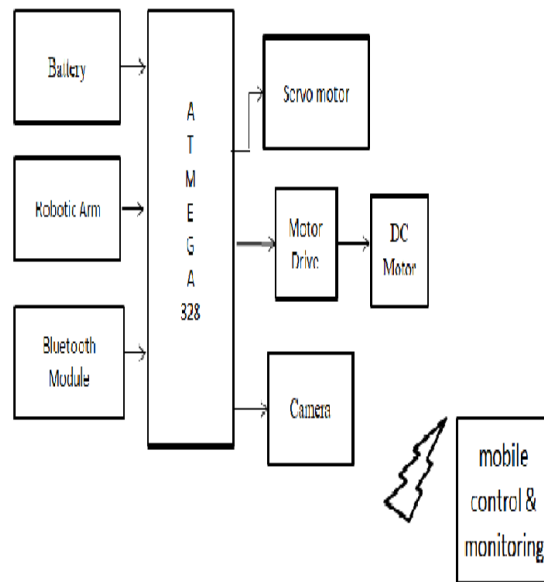
Figure 1. Basic Block Diagram

III. WORKING PRINCIPLE

The robot is then made to move towards the cotton plant. The wheels used in the robot are connected to the motors and these motors are connected to the motor drivers. The wheel operations include moving forward, backwards and sideways. So, if an obstacle is present in the path of the robot, it can be maneuvered through a different path. These operations are made possible by using a Bluetooth module. The arm operations include upward movement, downward movement and opening and closing of its fingers. This arm is extended to the analyzed cotton bowl where its fingers clamp the cotton bowl, pluck it from the cotton plant and deposit it into the collecting box, which is attached to the robot. When the collecting box is full, all the tasks are suspended by using the stop operation and the cotton from the box is removed and the process continues. Cotton has been picked by hand for over centuries. It is still practiced in some parts of the world. Although, most of the modern countries have machinery for picking the cotton, it is still hand-picked in India. This leads to several health problems and also besmirches the cotton. In order to overcome these problems, mechanized picking is implemented. This is operated manually which reduces the labor cost and the time taken to pick the cotton. It is a one-time investment and cost of maintenance is low.

LCD

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in most applications. Liquid crystals do not emit light directly. They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they do not suffer image burn-in. LCDs are, however, susceptible to image persistence. They are available in a wider range of screen sizes than CRT and plasma displays.
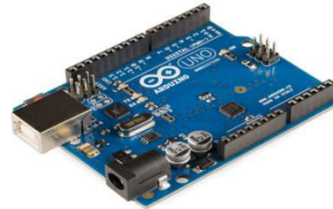
ARDUINO UNO

Figure 2 ARDUINO UNO SMD R3

Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits.

BLUETOOTH

Figure 3 :Bluetooth

Bluetooth is a wireless technology standard used for exchanging data between fixed and mobile devices over short distances using UHF radio waves in the industrial, scientific and medical radio bands, from 2.402 GHz to 2.480 GHz, and building personal area networks (PANs). It was originally conceived as a wireless alternative to RS-232 data cables.

Bluetooth is a short-range wireless communication technology standard. Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 35,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics.

BATTERY

An electrical battery is one or more electrochemical cells that convert stored chemical energy into electrical energy. Since the invention of the first battery (or "voltaic pile") in 1800 by Alessandro Volta, batteries have become a common power source for many household and industrial applications. According to a 2005 estimate, the worldwide battery industry generates US$48 billion in sales each year, with 6% annual growth. which are designed to be used once and discarded when they are exhausted, and secondary batteries (rechargeable batteries), which are designed to be recharged and used multiple times. Miniature cells are used to power devices such as hearing aids and wristwatches; larger batteries provide standby power for telephone exchanges or computer data centers.

IV.SIMULATION

Proteus 7.0 is a Virtual System Modeling that combines circuit simulation, animated components and microprocessor models to co-simulate the complete microcontroller based designs. This is the perfect tool for engineers to test their microcontroller designs before constructing a physical prototype in real time. This program allows users to interact with the design using on-screen indicators and/or LED and LCD displays and, if attached to the PC, switches and buttons. One of the main components of Proteus 7.0 is the Circuit Simulation -- a product that uses a SPICE3f5 analogue simulator kernel combined with an event-driven digital simulator.
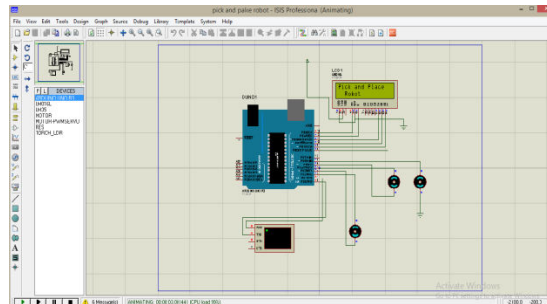
FIGURE 4: Simulation of The Proposed Method

V. HARDWARE IMPLEMENTATION
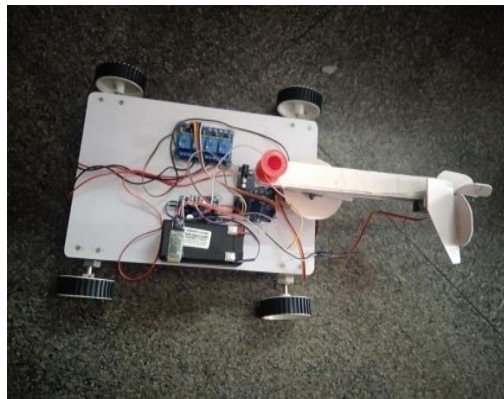
FIGURE 5: Hardware Implementation

The working of all these is made possible with the motor drivers, an Arduino mega 2560 and a Bluetooth module. The Arduino mega 2560 is programmed to operate the movement of the wheels, the robotic arm in such a way that it makes picking of cotton an easy job and the Bluetooth module, which is paired with the Smartphone for the operation of the robot, makes it easier. The robot is then made to move towards the cotton plant. The wheels used in the robot are connected to the motors and these motors are connected to the motor drivers. The wheel operations include moving forward, backwards and sideways. So, if an obstacle is present in the path of the robot, it can be maneuvered through a different path. These operations are made possible by using a Bluetooth module. The arm operations include upward movement, downward movement and opening and closing of its fingers. This arm is extended to the analyzed cotton boll where its fingers clamp the cotton boll, pluck it from the cotton plant and deposit it into the collecting box, which is attached to the robot.

When the collecting box is full, all the tasks are suspended by using the stop operation and the cotton from the box is removed and the process continues. Cotton has been picked by hand for over centuries. It is still practiced in some parts of the world. Although, most of the modern countries have machinery for picking the cotton, it is still hand-picked in India. This leads to several health problems and also besmirches the cotton. In order to overcome these problems, mechanized picking is implemented. This is operated manually which reduces the labor cost and the time taken to pick the cotton. It is a one-time investment and cost of maintenance is low.

VI.CONCLUSION

The aim of this project is the development of automatic pick and place robot arm controlled using arduino. The pick and place robots are popular in assembly lines, where the repetitive tasks are present. The robotic arm used here contain soft catching gripper which safely hand les the object. Since the assembly line is mostly about fixing different parts in to the right section of the end product, it is best done by the pick and place robots which can work round the clock without being tired or bored. In the modern era time and man power are major constraints for the completion of a task. By the use of our product the industrial activities and hazardous operations can be done easily and

safely in a short span of time. The proposed system is capable of lifting weights; by introducing high torque providing motor large weights can be picked.

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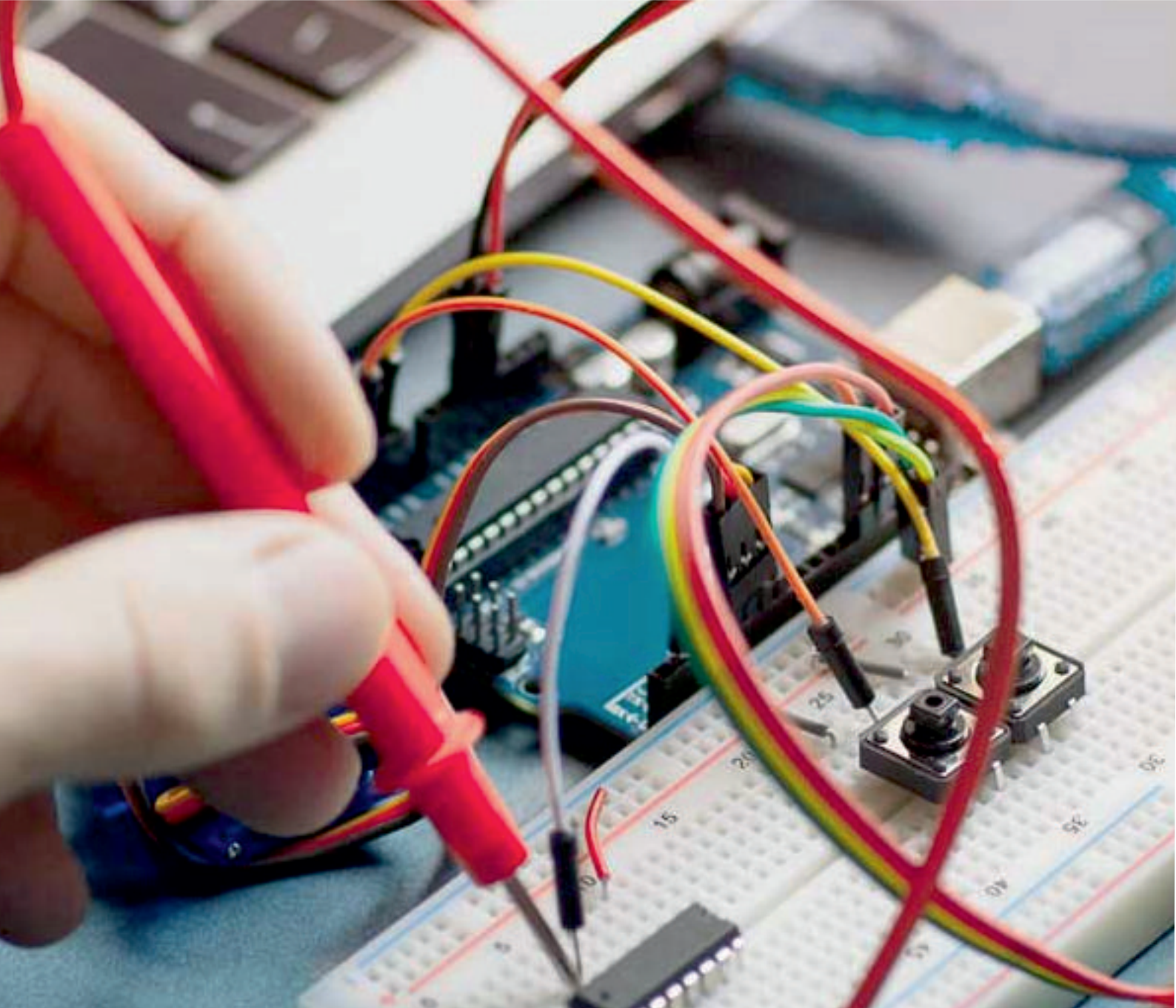
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