Vol-05 Issue 09, September-2021 ISSN: 2456-9348
Impact Factor: 5.004

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International Journal of Engineering Technology Research & Management

DESIGN AND IMPLEMENTATION OF AUTOMATIC ROPE ROBOT FOR SUPPLYING POULTRY FEEDS

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ABSTRACT
Poultry farming in India, in spite of several constraints, has progressed considerably during the last decade. The present study has been undertaken to examine various aspects related to growth and development of poultry production in the country. Poultry production in India was confined to backyards till recently. In poultry, feeding the fodder to boiler breeders is very bulky and hard. The boiler breeder takes the feeder in large amount of quantity. In present, the worker took the fodder in basin box and feed to the feeder box. The worker should pick up the fodder frequently to feed new poultries. Due to this frequent work, it leads to consume more man power. The problem of frequent feeding, more time consumption, health issues, The proposed work is to eliminate the frequent work and feed the poultry in large quantity in less time.

Keywords
Poultry Form, Robot, Automation, Automatic Rope

I.INTRODUCTION

Poultry farming such as chicken production in Malaysia has risen rapidly due to demand. Conventional poultry farming system is using traditional free-range farming where the poultry such as chickens and ducks are raised in open coop and allowed to roam freely during the day. This conventional poultry farming system requires more work load because poultry need to be fed regularly to be more productive. The Furthermore, conventional with method used manual feeding system which requires human workforce. This method has an a disadvantages because the farmers cannot ensure every poultry are being fed in the same amount. Cage system and deep litter system of rearing poultry are popular and well-known poultry rearing methods in farming industry. Cage system is a system of rearing birds that utilizes cage where birds is kept in several cages that are arranged in single or multiple rows.

Deep litter system is a system of rearing poultry in housings scattered with hash straw, saw dust, dried leaves or nut kernels on the floor area. The deep litter system is more frequently utilized worldwide and more popular than cage system. Although deep litter system is more popular than cage system, but it has several disadvantages than cage system. For example, deep litter system requires the feeder to be always kept dry and clean. The barn should be well ventilated, and the litter should be cleaned at least once in a week or if required. Litter needs to be changed promptly to prevent the growth of bacteria that can affects chicken production. Therefore, litter system needs additional work load than cage system. Besides, the feed given is not fixed for every chicken and mostly it will cause more feed wastage compare to the cage system where cage system has immediate steps to control the feed wastage.

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II.HARDWARE

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. There are two types of batteries: primary batteries (disposable batteries), 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.

The symbol for a battery in a circuit diagram. It originated as a schematic drawing of the earliest type of battery, a voltaic pile. Strictly, a battery is a collection of multiple electrochemical cells, but in popular usage battery often refers to a single cell. The first electrochemical cell was developed by the Italian physicist Alessandro Volta in 1792, and in 1800 he invented the first battery for him, a "pile" of cells.The usage of "battery" to describe electrical devices dates to Benjamin Franklin, who in 1748 described multiple Leyden jars (early electrical capacitors) by analogy to a battery of cannons.Thus Franklin's usage to describe multiple Leyden jars predated Volta's use of multiple galvanic cells. It is speculated, but not established, that several ancient artifacts consisting of copper sheets and iron bars, and known as Baghdad batteries may have been galvanic cells. Volta's work was stimulated by the Italian anatomist and physiologist Luigi Galvani, who in 1780 noticed that dissected frog's legs would twitch when struck by a spark from a Leyden jar, an external source of electricity.

RELAY

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. Forexample a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits the link is magnetic and mechanical.

Relays are usually SPDT or DPDT but they can have many more sets of switch contacts, for example relays with 4 sets of changeover contacts are readily available. Most relays are designed for PCB mounting but you can solder wires directly to the pins providing you take care to avoid melting the plastic case of the relay. You can see a lever on the left being attracted by magnetism when the coil is switched on. This lever moves the switch contacts. There is one set of contacts (SPDT) in the foreground and another behind them, making the relay DPDT. The relay's switch connections are usually labeled COM, NC and NO:

- **COM** = Common, always connect to this, it is the moving part of the switch.
- **NC** = Normally Closed, COM is connected to this when the relay coil is **off**.
- **NO** = Normally Open, COM is connected to this when the relay coil is **on**.

ARDUINO UNO

Microcontroller is a computer on a chip. Micro suggests that the device is small, and controller tells you that the device' might be used to control objects, processes, or events. Another term to describe a microcontroller is embedded controller, because the microcontroller and its support circuits are often built into, or embedded in, the devices they control. It is temporary storage unit. Arduino is an open a source microcontroller which can be easily

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programmed, erased and reprogrammed at any instant of time. Arduino uses a hardware known as Arduino development board and software for developing code known as IDE. The micro controller board used in our design is Arduino Uno, it is an open source platform used for building the electronic projects, it has both physical board and has own unique simplified programming language and has the endless possibilities such as we can interface several sensors, actuators like motors, here we did not required any dumper kit to dump the program in to the board Coming to the specification of Arduino Uno micro controller board, it uses Atmega328p-pu as the main micro controller, the operating voltage of the board is 5v, the recommended input voltage and limit input voltage is 7v12v and 6v-20v.

It consists of 14 digital input/output pins, 6 PWM digital input/output pins and 6 analog input pins, the dc current obtained from input/output pins is 20ma, and from 3.3v pin is 50ma. In the case of Arduino programming environment it containing a text editor for writing code. Building a complete microprocessor system on a single chip substantially reduces the cost of building simple products, which use the microprocessor's power to implement their function, because the microprocessor is a natural way to implement many products. It is important to understand that the Arduino board includes a microcontroller, and this microcontroller is what executes the instructions in your program.

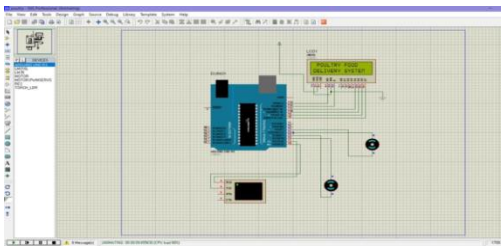
SERVO MOTOR

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

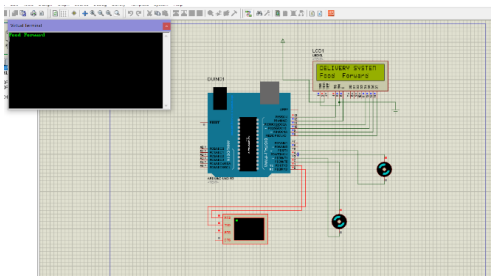
III.SIMULATION

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 that allow users to utilize any SPICE model by any manufacturer. Proteus VSM comes with extensive debugging features, including breakpoints, single stepping and variable display for a neat design prior to hardware prototyping.

Mode 1: start



Mode 2: Food forward



Mode 3 : left

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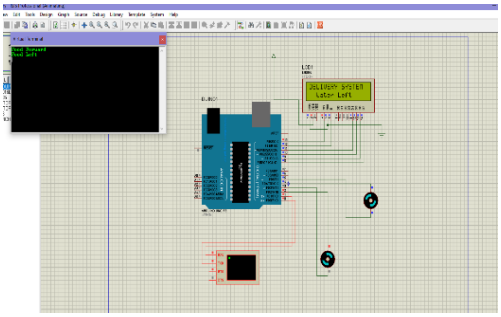
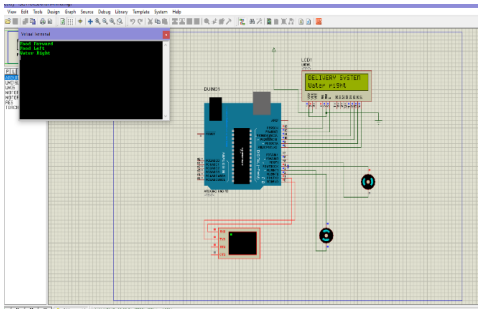
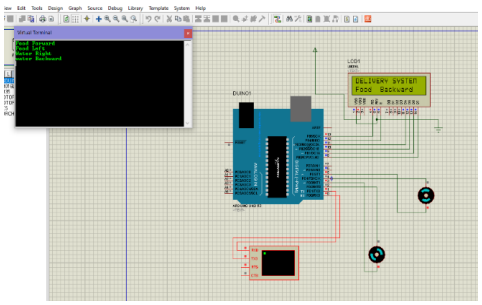


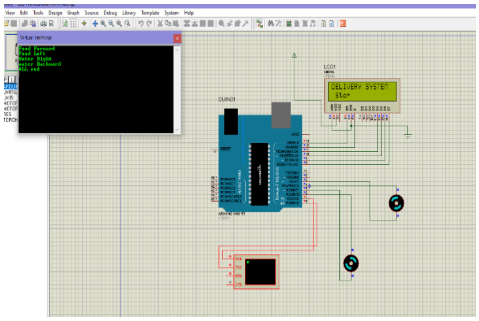
Mode 4 : Water right



Mode 4 : Water backward



Mode 5 : ALL end



IV.HARDWARE IMPLEMENTATION

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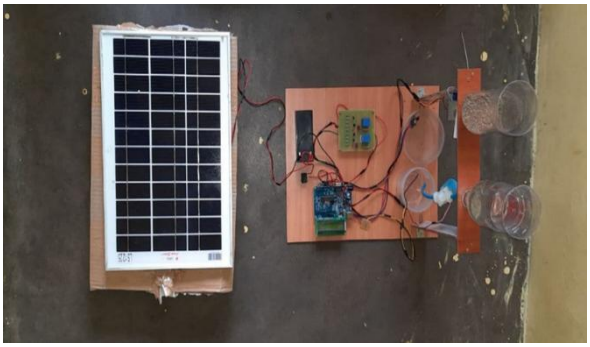

Fig.1. Hardware setup

At designing an autonomous robotic system that helps poultry to maintain their feeder system. the reduce man power. This can be achieved with a combination of Arduino uno based system, a hardware cleaning module and solar system. They can easily run and feeders and water distribution in help of solar power. It take energy from solar it poultry automation system.

V.CONCLUSION

In this paper, this work described the design and development of a robotic poultry feeder system consists of a line follower robot, automated feeder mechanism and line layout for barn. In this work, the performance of the proposed system has been experimented through using actual experiments. The propose system take into consideration a simplistic design and system that makes it easy for users to interact with low development cost. For future improvements, the robot will be improved by increasing the number of sensors and better sensors such as photoelectric sensor will be utilized to improve line detection. Solar power will also be used in future design so that it can be operated for longer periods of time. In addition, this robot feeder can be developed further by adding more application such as Internet of Thing (IoT) and Global System for Mobile Communications (GSM) to notify the user the condition offeeding process.

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