

AUTOMATIC SCARE CROW

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Abstract

To protect the harvest in the fields from predatory birds and other animals, farmers employ scarecrows. To protect his harvest from predatory birds and animals, a farmer strategically placed the scarecrow in the centre of the field. As we have seen, the scarecrow remains motionless whenever birds visit the area. As part of our project, we will be modifying this scarecrow so that it can detect the arrival of birds in the field using a PIR sensor, flap its arms in an upward and downward motion and sound an alarm using a buzzer. The flapping mechanism's job is to translate the motor's rotating action into the hands' reciprocating flapping motion. The hand is raised and lowered by means of the connecting rods when the crank rotates. By frightening the birds, you may keep them out of your field and protect your harvest. It does double duty in the garden.

Important terms: photoreceptor, mechanism for flapping, linear motion, and buzzer.

I. INTRODUCTION

Farmers often employ scarecrows to protect their crops from field animals and birds. The scarecrow's ability to frighten away birds and other animals helps farmers protect their crops. In order to keep birds and animals away from farmers' crops, a scarecrow is constructed in the hamlet using old clothes and wood, giving it a menacing appearance. You may also see scarecrows at airports and in gardens. You can't rely on a scarecrow to keep your crops safe at night. So, you may choose to use Automatic Scarecrow instead of Normal Scarecrow if you like. Smart Scarecrow is another name for an automatic

scarecrow. The efficiency of a regular scarecrow cannot compare to that of an automated or intelligent scarecrow. Protect your crops from birds and animals with an automatic scarecrow. No matter the time of day, it works. It operates on its own. Sensors, movable arms, and an alert system are all part of the automatic scarecrow's equipment. As we have seen, the scarecrow remains motionless whenever birds visit the area. The goal of the flapping mechanism is to transform the rotary motion of the motor into the linear motion of the scarecrow's hands, so that when birds enter the field, the scarecrow can detect their presence using a PIR sensor and then proceed to flap its arms up and down, accompanied by a buzzer to sound an alarm. As the crank turns, the connecting rods lift and lower the hand. By frightening the birds, you may keep them out of your field and protect your harvest. It does double duty in the garden.

II. METHODOLOGY

Our project process is structured as follows: 2.1 Details of the Mechanism The Design of Circuits (2.2) Section 2.3: Coding Section 2.4: Parts 2.1 Details of the Mechanism To control the upward and downward movement of the scarecrow's hands, we implemented a flapping mechanism in our project. Here are the specifics of the flapping mechanism: Mechanism for flapping In order to make the flapping hands move in a straight line, the flapping mechanism uses connecting rods to translate the rotational motion of the motor into the up-and-down movement of the hands. Elements such as a crank, a connecting rod, an arm that flaps, a support structure, nuts, and bolts make up the flapping mechanism. The crank is connected to a connecting rod at one end and to a flapping bar at the

other; when the crank turns, it pushes on the connecting

rod, which in turn pushes on the flapping rod.

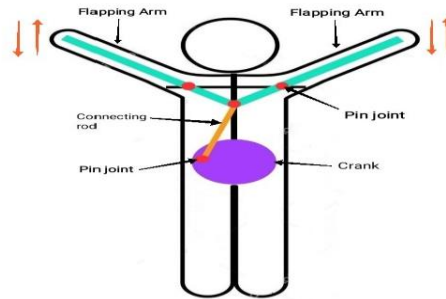


Figure 2.1: Flapping Mechanism

2.1 Circuit designing

Circuit consists of the following components:

Arduino

UNO Mot

or

Driver Mot

or

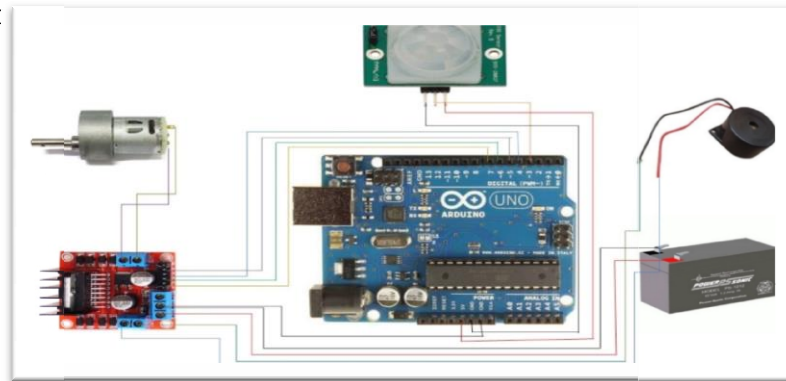
PIR

Sensor B

uzzer Ba

ttery

Connecting Wires



2.2 Programming

The programme code for the Arduino Uno is shown below.

```
int PIR=3;int BUZL = 4;int BUZR=5;
```

```
int MOT_L = 6;int MOT_R=7;
```

```
void setup() {Serial.begin(9600);
```

```
pinMode(PIR,INPUT);pinMode(BUZL, OUTPUT);pinMode(BUZR,OUTPUT);
```

```
pinMode(MOT_L, OUTPUT);pinMode(MOT_R,OUTPUT);
```

```
}
```

```
void loop()
```

```
{
```

```
int a=digitalRead(PIR);Serial.println(a);
```

Figure 2.2: Circuit Diagram

```
if(a==1)
```

```
{
```

```
digitalWrite(BUZL,HIGH);digitalWrite(BUZR,LOW);digitalWrite(MOT_L,HI
```

```

GH);digitalWrite(MOT_R,LOW);
}

else{ digitalWrite(BUZZL,LOW);digitalWrite(BUZZR,LOW);digitalWrite(MOT_
L,LOW);digitalWrite(MOT_R,LOW);
}
delay(10);

}

```

2.3 COMPONENTS:

There are a lot of components used while we are making our project Automatic Scarecrow. We have explained our project components into two parts, one is Mechanical Components and another is Electrical and Electronic components.

❖ Mechanical Components:

- a) Metal pipe
- b) Wood
- c) Nut and Bolts, Screws
- d) Thin steel rods

❖ Electrical and Electronic Components:

- a) Arduino UNO
- b) Motor, Motor Driver
- c) PIR Sensor, Buzzer
- d) Battery, Connecting Wires

❖ Mechanical Components:

❖ Electrical and Electronic Components

a) Metal pipe:

We have used square hollow section mild steel pipe for making Scarecrow's structure. Which provide strength to the structure of scarecrow.

b) Wood:

We have used solid wood and ply for making our project's mechanism (Flapping mechanism). Solid wood is used to provide support to the mechanism, and ply is used to make flapping hands, crank and connecting rod.

c) Nut and Bolts, Screws:

a) Arduino UNO:

Arduino UNO is a Microcontroller board used to read the signal of the sensor and control the motor driver and buzzer.



Figure a): Arduino UNO



b) Motor, Motor Driver:

Motor driver is used to control the motor directions and motor (DC Gear motor 12v) is used to drive the flapping mechanism.



Nut and bolts, Screws are used to joint the components into the structure and mechanism, Nut and bolts are used for temporary joint in the flapping mechanism to easily flap the scarecrow arms upward and downwards. Screws are used for permanent joint of the structure and the mechanism.



Figure c): Nut and Bolts, Screws

d) Thin steel rods:

Thin rods are used to make face of the Automatic Scarecrow.



Figure d): Thin Steel rods

Figure b): Motor, Motor Driver

c) PIR Sensor, Buzzer

PIR Sensor is used to detect the motion of the birds and animals. Alarm is used to produce noise to scare the birds and animals.

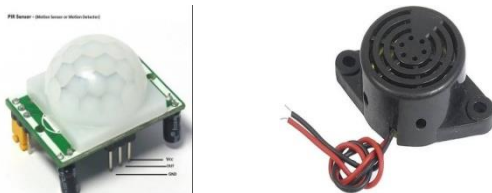


Figure c): PIR Sensor, Buzzer

d) Battery, Connecting Wires

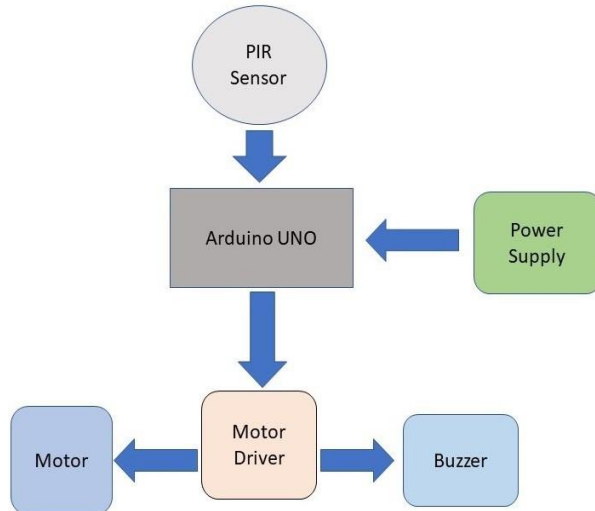
12v Battery is used to give power supply to the Arduino and Motor driver. Connecting wires are used to connect all the electrical connections.



Figure d): Battery, Connecting Wires

III. WORKING

We have divided our project working into two parts one is mechanism working and another is circuit working. In mechanism working, Flapping mechanism is used to move the Scarecrow arm in upward and



downward direction. A crank rotates and is connected to the connecting rod with movable joint and this connecting rod is further connected to the two arms by the movable joint, which moves in upward and downward direction. A T-shape joint is used to provide support to the mechanism.

In Circuit working, A PIR Sensor detects the motion of the birds and animals, it sends signal to the microcontroller (Arduino UNO), where motor driver and battery is connected to the Arduino. Further Arduino send the signals to the motor driver from where it sends signal to the motor and Buzzer.

Automatic Scarecrow model is shown in below figure;



Figure(III): Project Picture

IV. NECESSITY

An Automatic Scarecrow is required to save the crops from the birds and animals. It is effective in both day and night. It works automatically. Automatic Scarecrow provides all time security to the crops from the birds and animals. Scarecrow is used in fields to save the crops

and vegetables from birds and animals. Scarecrow is used in gardens to save the flowers. Scarecrow is used in garden to save the Fruits.

V. CONCLUSION AND FUTURE SCOPE

A Scarecrow does not effective in the night to provide the security for the crops. So there is an option of using **Automatic Scarecrow** instead of using Normal Scarecrow. Automatic Scarecrow can also be called as **Smart Scarecrow**. An Automatic Scarecrow or Smart Scarecrow is more efficient than a Normal Scarecrow. Automatic Scarecrow provides all time security to the crops from the birds and animals. It is effective in both Day and Night. It works Automatically. Automatic Scarecrow is equipped with Sensors, Movable Arms and alarming device.

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