

Design and Fabrication of Smart Farming Scarecrow

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Abstract

Humans have taken the scarecrow as a protector for the crops from the birds and animals. There are various types and designs for the scarecrows around the world. In this project we will develop the traditional scarecrows to become electronic and do more than one function at the same time. This scarecrow consists of several components, the most important of them is the sensor, which performs many functions, including sensing the presence of bird's movement, as well as enabling the flapping mechanism of the arm. The two arms in this scarecrow moves in linear motion when the device senses the presence of birds. There is a 360 degree night vision portable Wifi Camera installed over the head of the scarecrow for surveillance and this setup is powered by a DC battery which is charged with help of a solar panel. As mentioned earlier, the smart scarecrow will be designed to perform Multi-functions such as scaring birds away, as well as keeping the field under surveillance for that reasons we will replace traditional scarecrow by electronic one.

Keywords: Sensor, Flapping mechanism, Linear Motion, Buzzer, 360° Wi-Fi Camera, Solar Panel.

1. Introduction

An automatic smart scarecrow is normally used by farmers to save the crops from the birds and animals in the field. Smart scarecrow helps the farmers to save their crops by scaring the birds and animals. In village, a scarecrow is made by using the old clothes and sticks and giving it a scary look to scare the birds and animals to save the crops of the farmers. A scarecrow is not effective at the night to provide security for the crops. So there is an option of using an automatic smart scarecrow instead of using a normal scarecrow. An automatic scarecrow or Smart scarecrow is more efficient than a normal scarecrow as it provides all-time security to the crops from the birds and animals. It is effective both day and night. An automatic smart scarecrow is equipped with sensors, movable arms, and an alarming device. We have seen that scarecrow has no movement when the birds enter the field. In our project, we are going to modify the scarecrow that when the birds come into the field, it will sense the movement of birds with the help of the PIR sensor and move its hand up and down with the help of the flapping mechanism and it will start ringing with the help of a buzzer, the aim of the flapping mechanism is to convert the rotary motion of the motor into the linear motion of flapping hands. When the crank rotates, the connecting rods push the hand up and down. On the other hand, a 360° wireless rotating camera works in both modes either automatically or manually. It is depending on the farmer how he wants to use it. Additionally, it works day and night time. All electronic and electrical

components works using battery power. While the battery is charged by solar panel or electricity. An automatic smart scarecrow will help to scare the birds and the birds will run away from the field and the crop of the field will become safe. It can also be used in the garden.

2. Working

Our project working is divided 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 signals to the motor and Buzzer.

3. Results and Discussion

- [1] An automatic smart scarecrow effective in the day & night to provide the security for the crops. So there is an option of using automatic smart scarecrow instead of using normal scarecrow.
- [2] An automatic smart scarecrow is more efficient than a normal scarecrow. Automatic smart scarecrow provides all time security to the crops from the birds and animals as well as from thief. Automatic smart scarecrow is equipped with sensors, movable arms, 360° rotating camera and alarming device.

4. Conclusions

- [1] In this project we are able to reduce the efforts of the farmer and also saves the time, energy and cost required to perform these operations by making use of automation technology in order to improve the performance efficiency in agriculture field.
- [2] The capabilities of technology have been shifting forward together with time and its intervention has been helpful. Applying technology in the agriculture sector has significantly enhanced the country's agriculture sector.
- [3] During the course of this research, various limitations were evident and might have hindered the progress of the research. One acknowledged limitation involved the implementation of internet connectivity for IoT in the project. As mentioned in an earlier section, as farms are located in the rural areas, connectivity for the device may be an issue and this creates a barrier to finalizing the actual project.

5. References

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