iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** III **Month of publication:** March 2022

DOI: https://doi.org/10.22214/ijraset.2022.40703

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

A Review of Smart Agri Scarecrow

Dr. P. G. Mehar[1], Sagar Diwate[2], Parag Chaitguru[3], Prathmesh Kanher[4], Aniket Siriya[5], Krishna Kumar[6], Himanshu Surjuse[7]
[1]*Asst. Prof, Department Of Mechanical Engineering, KDKCE, Nagpur*
[2, 3, 4, 5, 6, 7]*Students, Department Of Mechanical of Engineering, K. D. K. College of Engineering, Nagpur*

Abstract: ***A Smart scarecrow is used to scare the birds and to the animals to save the crop in the fields. A farmer put the smart scarecrow within the middle of the sector to save lots of his crop from the birds and animals. We have seen that smart scarecrow has no movement when the birds are available field. A smart scarecrow is a decoy or mannequin, often in the shape of a human. Humanoid scarecrows are usually wearing old clothes and placed in open fields to discourage birds from disturbing and feeding on recently cast seed and growing crops. Scarecrows are used across the planet by farmers, and are a notable symbol of farms and therefore the countryside in popular culture. The common form of a smart scarecrow is a humanoid figure dressed in old clothes and placed in open fields to discourage birds such as crows or sparrows from disturbing and feeding on recently cast seed and growing crops. Machinery like windmills are employed as scarecrows, but the effectiveness lessens as animals become conversant in the structures. Farming contributes a major income to the Malaysian economy. It is an enormous concern to farmers once they are far away from their crops and exposing it to crops' threat like crow damaging the crops and theft. Farming has contributed to nearly up to 22% of a country's.***

Keywords: **Sensor, Flapping mechanism, Linear Motion, Buzzer, 360º Wi-Fi Camera.**

I. 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 to the farmers to save their crops by scare of the birds and animals. In village, smart scarecrow is made by using the old cloths and sticks and give it to a scary look to scare the birds and animals to the crops of the farmers. Smart scarecrow is additionally utilized in gardens and at the airports. A scarecrow doesn't effective within the night to supply the safety for the crops. So there is an option of using automatic smart scarecrow instead of using normal scarecrow. Automatic smart scarecrow can also be called as smart scarecrow. An automatic Smart scarecrow or Smart scarecrow is more efficient than a normal scarecrow. Automatic smart scarecrow provides all time security to the crops from the birds and anim als. It is effective in both day and night. It works automatically. Automatic smart scarecrow is equipped with sensors, movable arms and alarming device. We have seen that smart scarecrow has no movement when the birds are available field. In our project we are getting to modify this smart scarecrow that when the birds are available the sector, it'll sense the approaching of birds with the assistance of PIR sensor and move its hand up and down with the assistance of flapping mechanism and it'll start ringing with the assistance of buzzer, the aim of the flapping mechanism is to convert the rotation of the motor into the linear motion of flapping hands. When the crank rotates, the connecting rods pushes the hand up and down. On the other hand, 360º wireless rotating camera is works in both modes either automatically or manually. It is depending on the famer how he wants to use it. Additionally, it works day and night time. All electronic and electrical components are works by using battery power. It is c harger by solar panel or electricity. Automatic smart scarecrow will help to scare the birds and therefore the refore the birds are going to be run faraway from the sector and the crop of the sector will become safe. It can also be used in garden.

II. METHODOLOGY

A. Mechanism Details

In our project we have used flapping mechanism to move the smart scarecrow hands in upward and downward direction. The details for flapping Mechanism is given below:

B. Flapping Mechanism

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 pushes the hand up and down. The flapping mechanism consists of crank, connecting rod, flapping arm, support structure, nut and bolts. Crank is joint with one end of connecting rod and second end of connecting is joint with flapping bar, when crank rotates the crank push the connecting rod and connecting rod push the flapping rod up and down. The flapping mechanism used in automatic smart scarecrow is shown in fig. 1.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

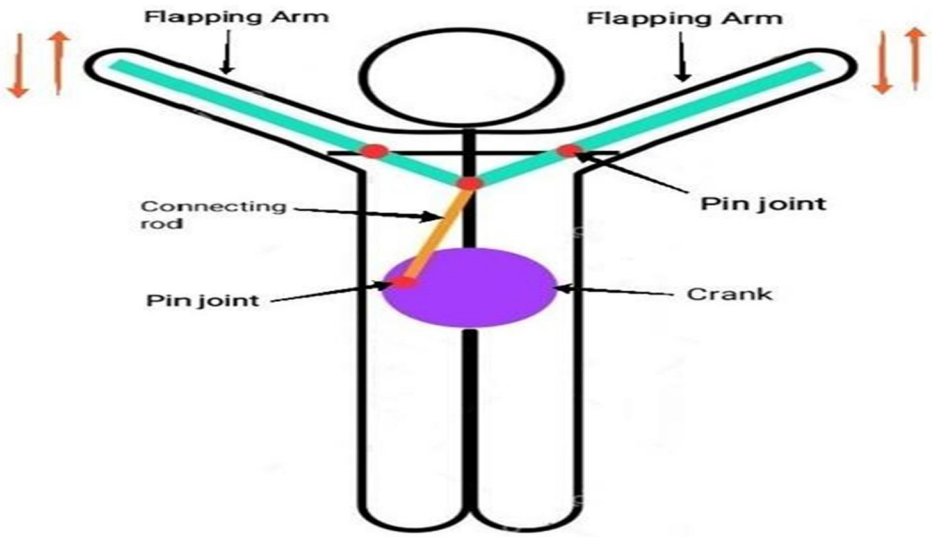


Fig 1: Flapping Mechanism

C. Electronic Circuit

The different components used in electronic circuit consists of following components:

1) Relay
2) Solar pane
3) 360º camera
4) Motor driver
5) DC Motor
6) Charging controller
7) Sensors
8) Buzzer
9) Battery
10) Connecting wires

III. COMPONENTS

There are a lot of components used while we are making our project automatic smart scarecrow. We have explained our project components into two parts, one is mechanical components another is electrical and electronic components.

A. Mechanical System Design

The different metal components used in fabrication of smart scarecrow are discussed as follows-

1) Mechanical System Design

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.



Fig a) Metal Pipes

©IJRASET: All Rights are Reserved

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.



Fig b) Wood

c) *Nut and Bolts, Screws:* 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 smart scarecrow arms upward and downwards. Screws are used for permanent joint of the structure and the mechanism.



Fig c) Nuts, bolts & screws

d) *Thin Steel Box:* Thin steel box is used to make faces of the smart scarecrow.



Fig d) Thin Steel Box

2) Electrical and Electronics System Design

The different electronic and electrical components used in fabrication of smart scarecrow are discussed as follows –

a) *Relay:* A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations.



Fig a) Relay

b) *Solar Panel:* Solar panels can be used to generate large amounts of electricity, and this process can take place both at solar and industrial scales. A key benefit of solar panels is that they can be used in providing electricity in remote areas as well, provided there is enough solar energy at that place.



Fig b) solar panel

c) *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

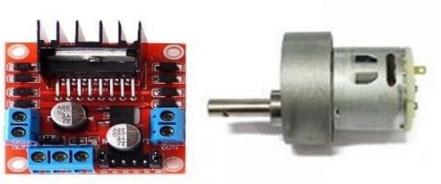


Fig. b) Motor, Motor driver

d) *PIR Sensor, Buzzer:* PIR Sensor is used to detect the motion of the birds and animals. Alarm is used for produce noise to scare the birds and animals.



Fig. c) PIR Sensor, Buzzer

e) *Battery and 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.



Fig. d) Battery, Connecting Wires

f) *360º Wireless Camera:* 360-degree surveillance cameras use a fisheye lens to record the entire scene and events, allowing for total situational awareness with no blind spots. The footage captured is then dewarped in real time, allowing security officials to pan, tilt and zoom through the entire scene.



Fig. e) 360º Wireless Camera

g) *Charging Controller:* A charge controller or charge regulator is basically a voltage and/or current regulator to keep batteries from overcharging. It regulates the voltage and current coming from the solar panels going to the battery.



Fig. g) Charging controller

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

IV. WORKING

The working of smart scare crow is takes places in two stages is as follows-

Working of buzzer/hand movement:

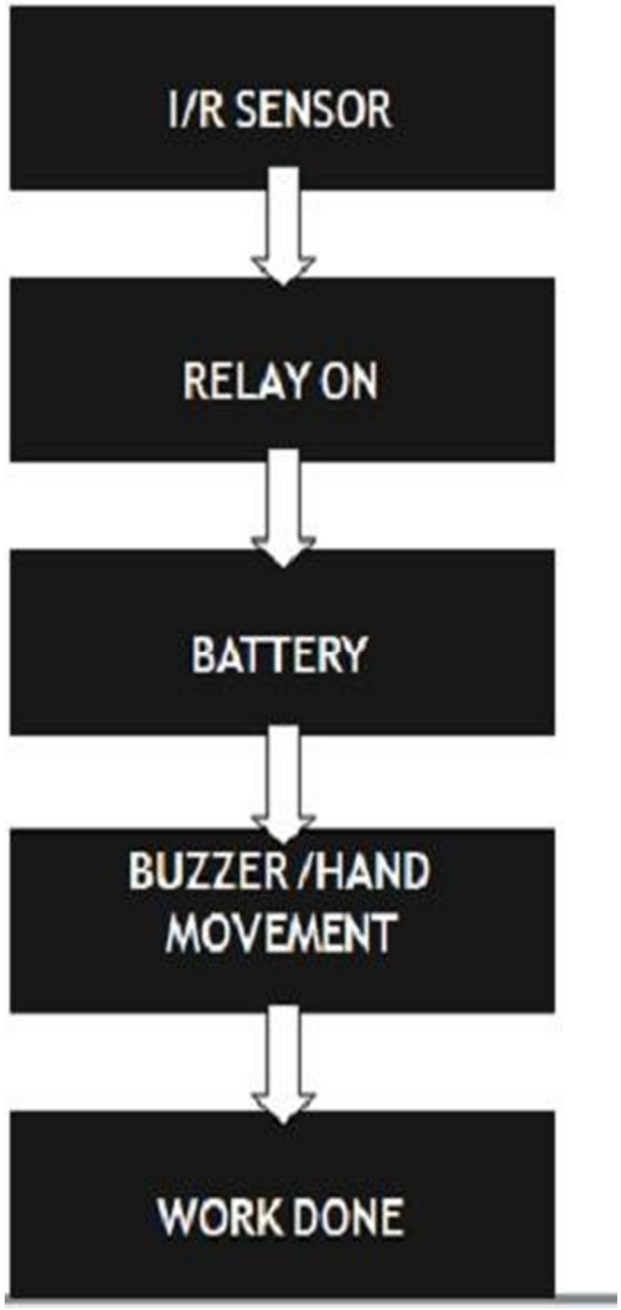


Fig.1) Working of buzzer/hand movement

Working of wireless camera:

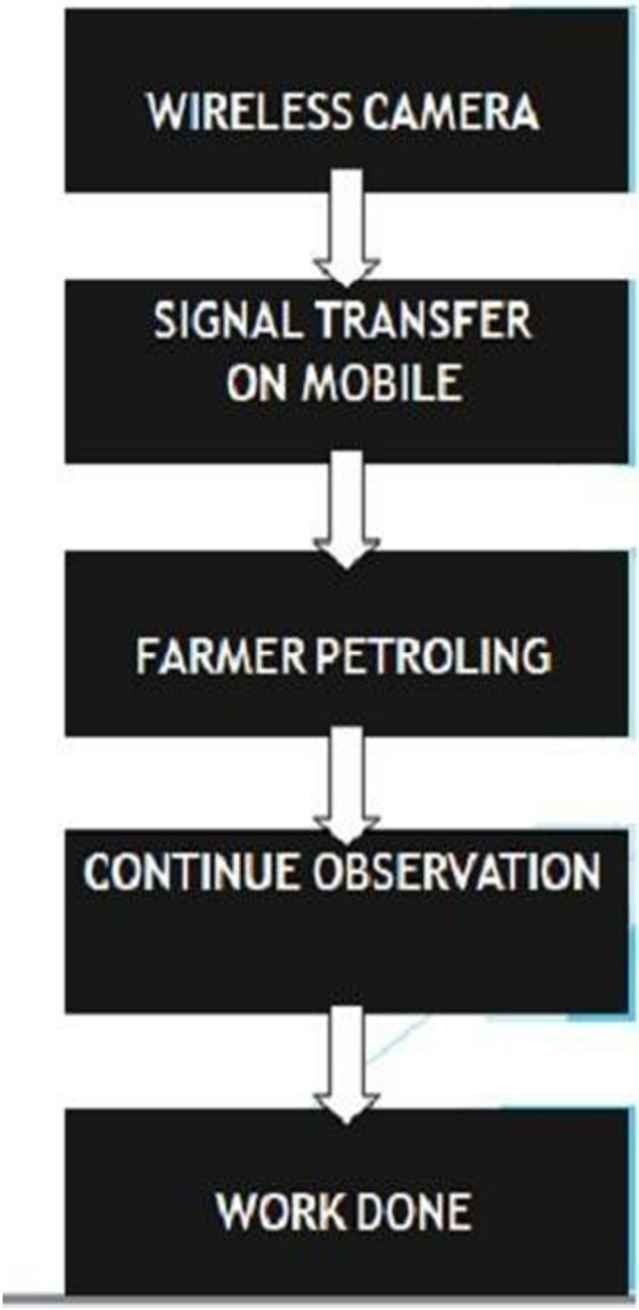


Fig.2) Working of wireless camera

V. RESULT&CONCLUSION

A. 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.

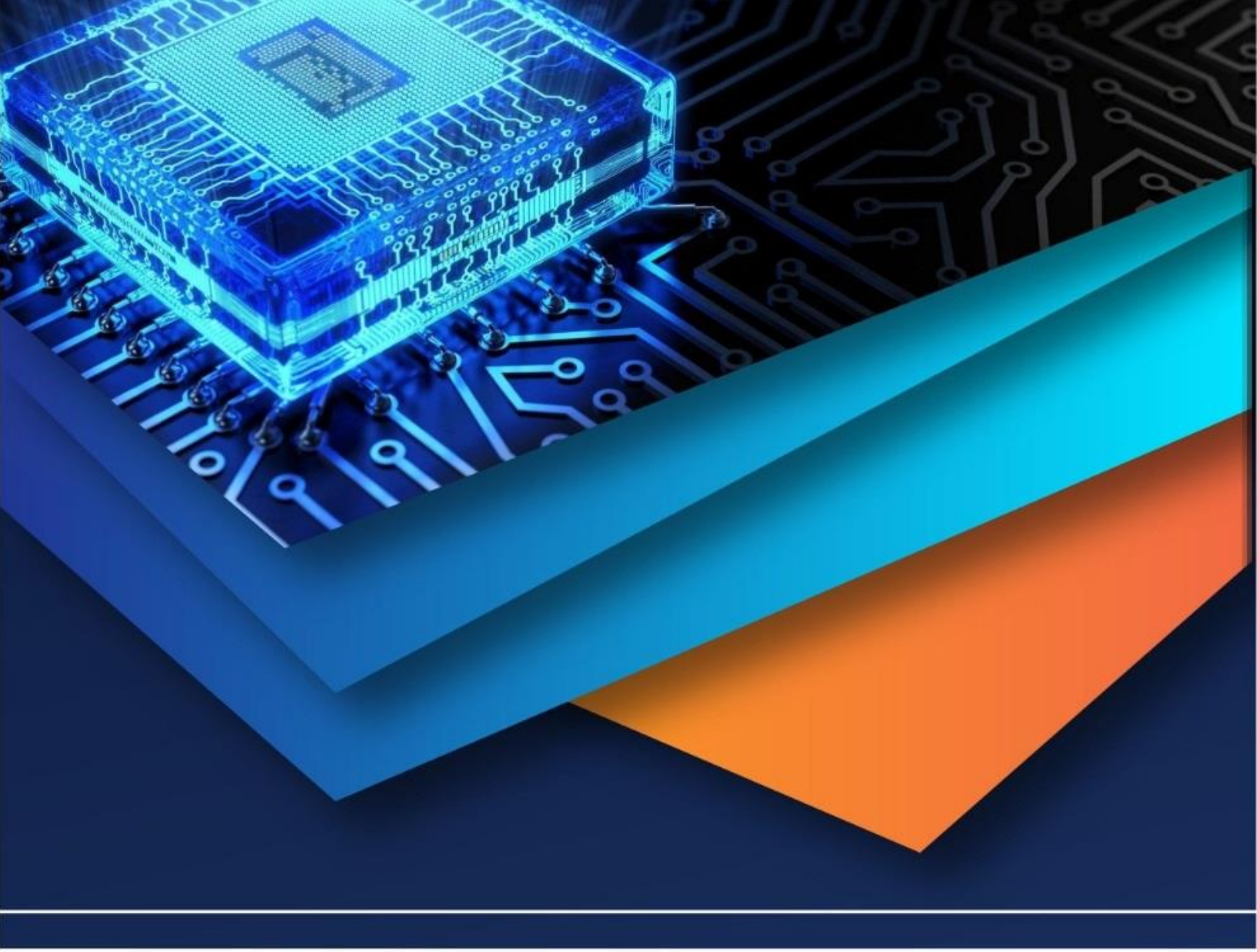
B. An automatic smart scarecrow is more efficient than a normal scarecrow. Automatic smart scarecrow provides all time security to the crops from the birds and animals as well as from thief. Automatic smart scarecrow is equipped with sensors, movable arms, 360° rotating camera and alarming device.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

REFERENCES

[1] Pornpanomchai, Chomtip & Homnan, Malinee & Pramuksan, Navarat & Rakyindee, Walika. (2011). Smart Scarecrow. Measuring Technology and Mechatronics Automation, International Conference on. 3. 294-297. 10.1109/ICMTMA.2011.644.
[2] Król, Karol & Kao, & Hernik, Józef. (2019). The Scarecrow as an Indicator of Changes in the Cultural Heritage of Rural Poland. Sustainability. 11. 6857. 10.3390/su11236857.
[3] Alneimi, A. A., Alsaidi, M. J., & Elahag, M. F. (2020). Multi-function e-scarecrow (MFeSC). Journal of Student Research.
[4] Barakat, Osamah & Hashim, S & Ramli, Abdul & Hashim, Fazirulhisyam & Samsudin, Khairulmizam & Al-Baltah, Ibrahim & Al-Habshi, Mohammed. (2013). SCARECROW: Scalable Malware Reporting, Detection and Analysis. Journal of Convergence Information Technology. 8.1-12.
[5] Miller, David & Milstein, Jacob & Stein, Cathryne. (2007). Scarecrow: If I only had AI. Auton. Robots. 22. 325-332. 10.1007/s10514-006-9017-4.
[6] Lesté-Lasserreof, Christa. (2021). Scarecrows at sea may save many birds. New Scientist. 250. 21. 10.1016/S0262-4079(21)00832-0.
[7] Araguz, José. (2020). Confessions of a Former Scarecrow. Prairie Schooner. 94. 31-32. 10.1353/psg.2020.0082.
[8] Betz-Heinemann, Khalil & Tzanopoulos, Joseph. (2020). Scarecrows and Scapegoats: The Futility and Power of Cleaning a Landscape. Worldwide Waste: Journal of Interdisciplinary Studies. 3. 10.5334/wwwj.33.
[9] Abdelhakim, Walaa. (2020). Scaring Birds: The concept of the Scarecrow in Ancient Egypt. International Journal of Heritage, Tourism and Hospitality. 14. 42-51. 10.21608/ijhth.2020.154143.
[10] Davies, Sarah. (2018). Dingle dangle scarecrow. Early Years Educator. 20. viii-ix. 10.12968/eyed.2018.20.4.viii.
[11] Nollkaemper, Andre. (2015). Saving the Scarecrow. European Journal of International Law. 26. 957-964. 10.1093/ejil/chv060.
[12] Delanty, Greg. (1991). The Scarecrow. The Irish Review. 10. 10.2307/29735594.
[13] Hone, Elizabeth. (2010). Science “Scarecrows”. School Science and Mathematics. 70. 322 - 326. 10.1111/j.1949- 8594.1970.tb08631.x.
[14] Thomas, James. (2002). Automated deer scarecrow. Journal of The Acoustical Society of America - J ACOUST SOC AMER. 112. 10.1121/1.1514548.
[15] Roy, Saugata & Mazumdar, Nabajyoti & Pamula, Rajendra & Tarkas, Divya. (2021). Efficient Pest Bird-Controlling Algorithm in Unmanned Agriculture System. 10.1007/978-981-15-7804-5.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)