Farmer Fencing Alert System

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Abstract – electrocution is a threat to the living. Heavy life losses are seen across the country. Agricultural practices are also a cause for these scenarios. Protection of farms through electricity is a practice to be discouraged. Laser systems can replace them. Farmer fencing alert system is one such method which uses simple lasers to fence the farms.

Keywords- Farmers; Agriculture; Electrocution; fencing alert system; Laser made fencing;

Introduction

Though it has gained only a little concern in the past few decades electrocution is a major threat to the living beings. Electrocution is to injure or kill a living being with electric short circuit.

One can blame the electricity department, poachers and farmers responsible for this. The first two, however, government is taking a serious action to avoid such incidents. It has become a common practice among the farmers nearby the forests to put a fence around their farms to protect it from the wild trespassers.

Data from a Delhi-based NGO, Wildlife Protection Society of India (WPSI), shows 355 elephants across the country died from deliberate and accidental electrocution between 2010 and 2016 — 62 of these deaths took place in 2016 alone. The list identifies flamingos as the second largest casualty of animal electrocution, at 181, followed by leopards and peacocks at 64 deaths each over six years. Their study also identified 19 tigers, 17 sloth bears, 11 lions and animals such as Nilgais, deer, wild boars, cranes, the Great Indian Bustard and langurs have all fallen prey to these high-tension wires, that too within their own habitat, over six years.

When analyzed the reasons behind these cases, it was evident that farmers' ambition was to protect their farms rather than to kill the wild invaders. In fact, in some cases, these fences accidentally killed many humans, who came across them.

In this paper, we propose a solution to put an end to the electrical fences and protect the farms from trespassing.

Proposed method

Our primary agenda is to curb the practice of electrical fencing and, suggest and develop an alternative.

A general idea is to scare the animals away from the farm by adopting various methods such as, by producing threatening sounds and emitting light.

Let's say an animal has approached the farm, when it is detected by the sensor a sound, this can be a blast sound or any sound which scares the animal, is made at the centre. So the target of our method is to:

- Make a sensor circuit which would detect animal trespassing.
- Create a sound that could threaten the animals

Implementation

Circuit prototype

In this circuit we have set reference voltages of comparators by using potentiometer, we can say this sensitivity of the circuit. Comparator is configured in non-inverting mode. In this system we have placed laser light and LDR facing each other, so laser light continuously falls on LDR. Due to this a potential difference generated across the non-inverting pin of comparator, then comparator compare this potential difference with reference voltage and generate a digital output as HIGH. Before this we have configured 555-timer in mono-stable mode so we it required a LOW trigger pulse at its trigger pin to activate buzzer and LED. So

we applied output of comparator at trigger pin of 555-timer. Even comparator's output is HIGH when laser lights falls on LDR so at this time buzzer and LED are deactivated. When someone crosses the laser light due to this LDR lost the laser light and generates a different potential difference across the same comparator terminal. Then comparator generates an output as LOW. Due to this LOW signal 555-timer gets a LOW trigger pulse and activates buzzer and LED for a time periods that is defined by R1 and C1 at 555-timer circuit.

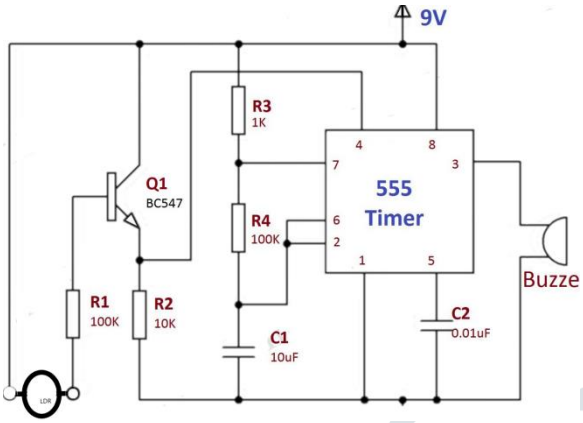

Fig.1: circuit diagram

Container design

The containers are designed in such a way that it contains a laser end and a receiver end. At the receiver end the circuit with an LDR and buzzer is integrated. At the laser end there is a laser circuit. These two are arranged opposite to each other, where laser beam falls on the receiver. When there is an interruption between them the circuit at the receiver's end breaks to produce buzzer.

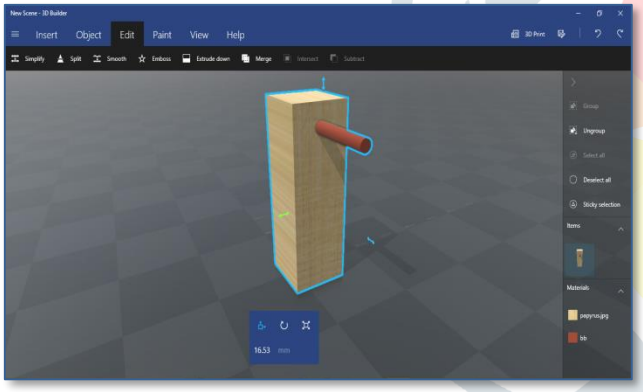

Fig.1: laser end

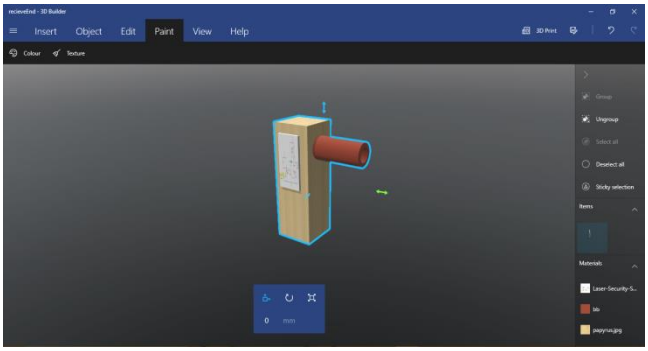

Fig.2: receiver end

Results and Discussions

Prototype is deployed in the farms to check the efficiency of the model. Intensity of the laser played a vital role in this prototype. LDR was difficult to handle as it was highly sensitive to the daylight, which lead to many upgrades in the prototype. A narrow tube is used to cover the LDR, which is expected to avoid the daylight contact with the LDR.

Regular Lasers, when used for large farms, are not much efficient. Their precession is lost as the distance between the two ends increased. To cope up with this situation we had to use a high precession laser. Initially, results were good in terms of protection it fetched. Later, we found that these laser were too harmful to use as they are causing partial blindness among the animals which came in contact with these lasers.

Conclusion

The whole idea of the paper is to project the issues of electrocution and the remedies to avoid them. The proposed model gives the optimal solution for this prevailing problem, provided, the strong sensors are replaced with any alternative technology which detects the animal movement with low costs and not causing any harm to the living beings.