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A Novel Technique to Protect Human from Wild Animal with Arduino and Load Cell

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ABSTRACT

There are many technologies are already available for detecting animals. But these methods are not protecting human beings. To avoid this problem, the proposed system has been developed to detect animals based on weight at nearby forest area and to protect the human from the animals through electric fence camp. In this method, the system detects the weight of the animal with electronic device and above the particular weight; it will be connected to the electric fence to prevent the entering of animal.

Keywords : Load Cell, Amplifier, Weight Detection Device, Arduino

I. INTRODUCTION

Nowadays, the animals are come out from the forest due to the climate change and habitat destruction. One of the biggest reason is most of the animals are carnivores, that were attracted towards the cities which maintained by green environment. Many types of forest are available in the world. In India, 5 types of forest are available such as Tropical evergreen forest, tropical deciduous forest, mangrove forest, throne forest and Himalayan forest. Forest is the land in which large amount of plants such as trees, shrubs, bushes are abundant. And also wild animals are living.

Many people living area is nearby forest. Many people living near the forest, they mostly depend on the forest for their living. Due to environmental destruction like tree destruction, low rain fall, climate change, the animals are moving out to the cities. Human being has cleared the forest for human settlements industrial purposes, construction of roads, railways, houses and dams. The outcome of animals from the forest affects the agriculture lands and living creatures.

II. Literature Review

- Human can recognize the object at various levels. Human can detect what kind of object, where it is present and which type of object etc. An important issue in this concept is whether it is an object of human or animal [1].
- Many methods are available to identify the object through image, even the image was in poor quality vision in existing methods. But a few amount of study has made in this concepts. In existing method, peripheral visual function was limited with the range of eccentricities. Ability to detect is a natural object of entire world in visual field would be distinct [2].
- Fence has high voltage power supply of 1 to 2 seconds intervals. When animal touches the fence while standing on the ground, the electrical circuit will be processed so that the animal will experience the shock. 2000 volts of power supply will be maintained in the fence to repel the animal [3].
- The electrical current is passed over the fence for one pulse per second, when the animal touches the fence, the electrical current will be passed and the animal will be shocked. The shock is sufficiently memorable never forget [4].
- Nowadays, the developed countries are used to detect the mobile navigation system with monitoring and tracking system such as bus, car, bike, taxi etc. According to the vehicle system, there is a problem to find the weight of load in the vehicle.Its needs to measure the weight of objects is very essential for identify the condition of weight, fuel sensors, information of mobility and so on [5].

- Load Cell sensor is used to detect the weight and force in industry for very long period. The sensor performance based force and weight is main factor that influenced to production and manufacturing in industries [6].
- Load cell is mainly used for sensing items with weight. Nowadays, this sensor is very much used in machine industry, security, medical field, business application etc. In vehicle, restraint system with strain gauge is used to secure passengers. The strain gauge mainly used to measure the tension of sensor, once the seatbelt is tightened. Both strain gauge measurement and signals are sent to control unit, because for determine the child or adult is buckled properly [7].
- Load cell is mainly focused to fluid monitoring such as blood circulation, dialysis, donation of blood, etc. It is used in hospital for calculating accurate patient weight. Weight sensor can use under the bed of patient at hospital to monitoring the patient even in the night time [8].
- Load cell sensor or weight sensor is mainly used in home such like washing machine to maintain the weight of water supply [9].
- Not only washing machine, microwave ovens are manufactured with weight sensor to determine time based with weight. Some hotels uses sensor for weight detection in refrigerator [10].
- Load sensors are used to send information to computer to determine the car capacity [11].

III. Existing Method

Due to deforestation that receive unseasonal and irregular rainfall and the temperature of earth is automatically increasing day by day and lost rare variety of plants, animals etc., For these reason, the forest has been dried. In this situation, animals did not have food from forest. The wild animals mainly deer, elephant, cheetah are coming out of the forest and protruded in to the villages. These animals destroy the village people's fields, agricultural lands and gardens. To save from this problem, the human are using manual action to avoid the coming of animals such as fireworks, shooting, etc.

For forbidden there difficulties nowadays many villagers built fence around their living area and also in some places they built current fence for avoiding elephants. In some area canals are digged around their villages. But elephant like animals easily entered beyond this fence. Some small animals like rabbit, peacock affected by this fence. The proposed system has been developed to detect the animal and avoid the animals by coming inside the city.

IV. Proposed Model

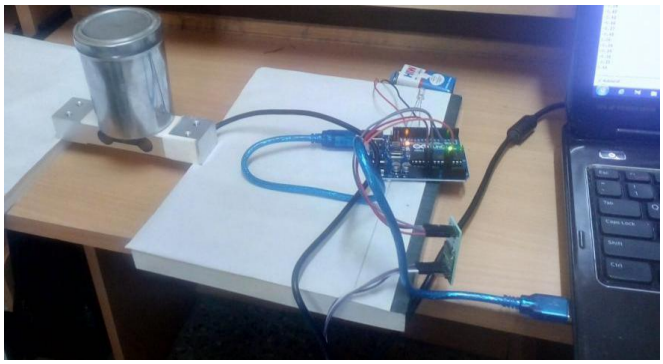

Figure 1. The proposed system to detect the object through weight

This proposed system has the same current fence with some extra weight detector device. Weight detector belt is arranged along with the current fence area. It covered area of five feet breadth along with fence. If any animal crossed in that belt, the current flow will be adjusted along with the animal's weight. If any small animals like 5 to 10 Kg weight crossed the belt, the current is low, there is no reaction are done. But, if any small animals like 10 to 50Kg weighted cross the belt, the animals become slightly shocked with current. Because for it will run out. If the animals come to know about the current shocking is that area, it did not like to cross the belt. If huge animals like elephant, wild buffalo are crossed that belt, the belt activated with high current. The current supply passed to the fence according to the weight of the animal. If the animal weight is increased, the supply of current also increased automatically. The current supply time may be two to three minutes. So definitely the huge animals are affected. It becomes fainting or sometimes only causes death. If the animal weight is increased automatically the supply of current also increased. This is the weight detector device.

4.1 Algorithm of proposed system

create database "searching_items";
defind protectionsystem
create packages
{load cell, amplifier, arduino, computer} main()
{find weight_detection()
{if weight <= 500 grams

then write “there is no change”
keep waiting(delay 200);
else weight > 500 grams
write “objects are available”
find weight
connection established to power supply current passed to fence camp LED has glow with current pinmode of LED(output)
keep waiting (delay 1000);}

4.2 Flow diagram of proposed system

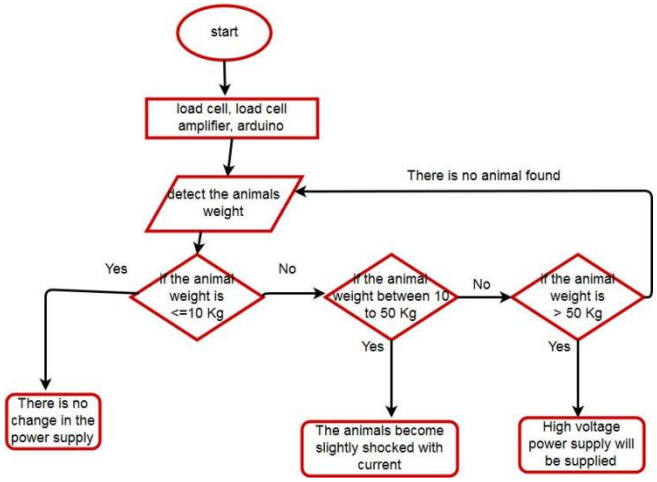

Figure 2. Flow Diagram for working method of proposed system

4.3 Working method of proposed system

Load cell amplifier has four pins such as E+, E-, A+ and A-. Figure show the red wire for E+ pin connection, black wire for E+ pin connection, white wire for A- pin connection and green wire for A+ pin connection. These connections has powered by 5V battery and Arduino ground connected to load cell amplifier ground. Load cell amplifier Dt has connected to A1 pin of Arduino. Similarly, SCK has connected to A0 pin of Arduino.

Arduino was connected to computer and other side of the arduino connection was established to load cell amplifier through wire. Load cell was connected with arduino to detect the weight of object. There is no indication for the weight upto 500 grams. Suppose if it is above 500 grams, then LED light will be glow. In this design has only implemented with ½ Kg and 1 kg objects. If the weight of object is below ½ kg, there is no change in the system. Similarly, if the weight objects is above ½ Kg, the system activated by power supply. At the same time, the high current passed through the fence. LED light was fixed on the fence was glow with the passing current. These all works are done automatically.

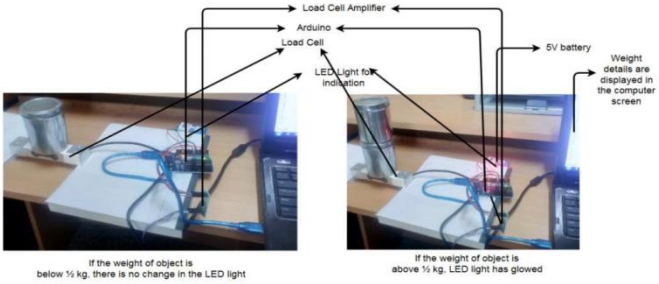

Figure 3. Working design of proposed system to detect the object through weight

4.4 Basic source code to find weight detection

```
void setup() {
Serial.begin(9600);}
void loop() { Serial.print(scale.getGram(), 1);
Serial.println(" g");
delay(200);}
led: void setup() {
pinMode(LED_BUILTIN, OUTPUT);}
void loop() {
digitalWrite(LED_BUILTIN, HIGH);
delay(1000);
digitalWrite(LED_BUILTIN, LOW);
delay(1000);}
```

V. Further Enhancement

In the proposed system, the system is maintained with certain conditions like when it is below 10 Kg, there is no power supply. If suppose it is between 10 to 50 Kg, there will be limited power supply, but it does not affect the animal greater. It just alarm to run animal from a place. If it is above 50 Kg, then the power supply will be high and it may also make animal to unconscious. Even then it has a greater advantage it also have some problem like sometimes animal may cause a health issues. To overcome this problem, in future enhancement just by giving a heavy alarm, the animal may run out from that particular place. At the same time, when it is a human, the alarm will be raised, but it will have limited sound. This system will be developed with these concepts of not disturbing the human being.

VI. Discussion

Here the implementation is made with the weight of object, which is above 50Kg. The power supply will be passed through the fence when it is above 50 Kg. In a proposed system, the power supply will be passed from the amount of 10 Kg animals.

The availability of power supply over the fence to protect from the animals already exists in many projects. The disadvantages in the existing model, the power are supplied continuously whether the object is detected or not. In a proposed system, the greater advantages, when the object is detected, the power supply will be passed for 2 to 3 minutes only. So, the resource will be saved and energy consumption will be reduced.

VII. CONCLUSION

The proposed system has been helpful to protect the animal from forest to entering into the cities. The agriculture lands, human beings can be protected and safe from the animals. Due to this advantage, the humans need not to afraid of the animals entering.

VIII. REFERENCES

[1]. Junguo ZHANG, Wenbin LI, Ning HAN, Jiangming KAN, "Forest fire detection system based on a ZigBee wireless sensor Network", Research Article, Front. For. China 2008, 3(3): 369–374, DOI 10.1007/s11461-008-0054-3

[2]. Simon J. Thorpe,Karl R. Gegenfurtner,Miche¡le Fabre-Thorpe and Heinrich H. Bulthoff, "Detection of animals in natural images using far peripheral vision", E uropean Journal of Neuroscience, Vol. 14, pp. 869±876, 2001

[3]. Electric Fence Energizer, Power wizard shock technology,INST-04-0003-00 0092 Rev.7-07

[4]. Power Fence Systems User Manual, Published By Gallagher Group Limited, 2008

[5]. Mehran Safdar, A Mobile Vehicle Weight Sensor and its Application in Transportation, Ist International Electronic Conference on Remote sensing, 2015

[6]. Z. Wang, H. Hu, "Analysis and Optimization of a Compliant Mechanism-Based DigitalForce/ Weight Sensor," IREE Sensors J., vol. 5, no. 6, pp.1243-1249, Dec. 2005.

[7]. H. Lichtinger,R. Graf, "Seat Belt Force Sensor System," U.S. Patent 7 234 729, 2007.

[8]. B.Al-Hashimi,D. DeRoure, and J. Lewis, "Big Brother sensors to monitor the Elderly,"

[9]. B. Koo, "Washing machine water level detecting method using weight sensor," U.S. Patent 5 720 064, 1998.

[10]. D. Terdiman, "Vegas gets you with weight sensors in the fridges,"

[11]. Harris, Tom,"How Elevators Work,"