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Anti Smuggling and Animal Intrusion System in the Forest Using Raspberry Pi

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ABSTRACT: Wildlife smuggling or trafficking involves in illegal gathering, transportation and distribution of animals and their derivatives. This can be done either internationally or domestically. Estimating the money generated by the wildlife smuggling varies, in part because of its illegal nature. Smuggled wildlife is an increasing global demand. So we have proposed a system which monitors and prevents smuggling carried in the forest and thereby conserve wildlife. Usually the wired transmission in the forest is not reliable. If it taken into action, it will not be suitable for wildlife habitat. The systems consist of Raspberry pi microcontroller interfaced with fire sensor, camera, ultrasonic. In case of problems the tree unit Wi-Fi module along with the exact geographical location using GPS. And also real time data is being updated from the tree unit to the monitoring section using IOT. This ensures data security and provides privacy.

KEYWORDS: Trafficking, Raspberry Pi, Wildlife Habitat.

I. INTRODUCTION

In recent years' wild animals are special challenge for the farmers throughout the planet. Animals like wild boars, elephant, tiger and monkeys etc., cause serious damage to crops by animals by running and trampling. It causes the financial problem to the farmers. To overcome this problem, we provide a solution during this paper. This paper is used to protect the farmland by using raspberry pi. This paper utilizes the RFID (Radio Frequency Identification) module and GSM (Global System Mobile) modem for this purpose. Forest officer and farmers will get the SMS through Gmail thereby containing area during which that animals observe. Radio frequency identification (RFID) is employed to explain a system that transmits the identity (in the shape of a singular serial number) of an object wireless, using radio waves. The RFID injector tag is created for injection under an animal skin. It is injecting within the animal product, if the animals enter into the farm land the RFID reader detect the animal and send the message to the forest officer and farmers using GSM. And also the animal's repellent to the forest by using irritating noise by provided speaker and creating smoke by using fogging machine.

Surveillance plays a serious role in many fields be it reception, hospitals, schools, public places, farmlands etc. It helps us to monitor a certain area and prevent theft and also provides proof of evidence in case of occurrence of such incidents. In the case of farmlands or agricultural lands surveillance is extremely important to stop unauthorized people from gaining access to the world also on protect the world from animals. Various methods aim only at surveillance which is especially for human intruders, but we tend to forget that the most enemies of such farmers are the animals which destroy the crops.

II. SYSTEM MODEL

In our paper, we have developed the smuggling prevention system using raspberry pi and IoT. When someone invades the forest the ultrasonic sensor present in this paper receives input signal and it triggers camera to activate ON condition. It captures image and sent the signal to the raspberry pi board. It detects the image and transmit to the server unit. The transmission is takes place via Wi-Fi module. In addition, we include RFID tag and reader for the one who is going to work in forest for maintenance and other authorized activities. Also we provide LDR for the prevention of invading of animals into village/city. In brief the system consists of Raspberry pi microcontroller interfaced with fire sensor, camera, ultrasonic. In case of problems the tree unit Wi-Fi module along with the exact geographical location using GPS. And also real time data is being updated from the tree unit to the monitoring section using IOT.

The main objective of this system are as follows:
- To prohibit the entry of animal into the village.

• To protect the reserved area from smugglers.

• To design a system that is used to repel the animals (Fear based Repellent) and notify the authorized person.

BLOCK DIAGRAM
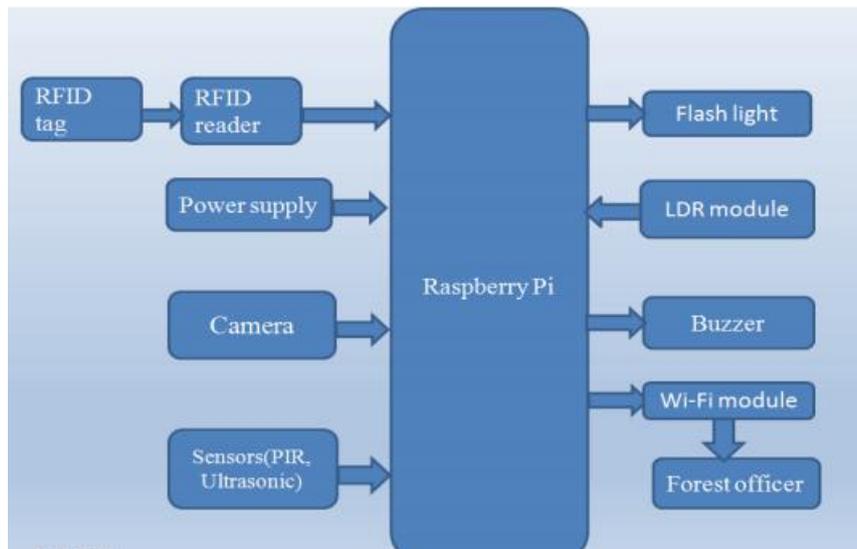
III. PROBLEM IDENTIFICATION

Wild animals like monkeys, elephants, wild pigs, deer, wild dogs, bison, nilgais, estray animals like cows and buffaloes and even birds like parakeets cause tons of injury to agricultural lands. This leads to the poor yield of crops and significant financial loss to the owners. This problem is pronounced for sometimes the farmers decided to leave the barren areas due to continuous animal attacks. This system helps us to stay away such wild animals from the farmlands also as provides surveillance functionality. It has been found that the smell of rotten egg helps to stay the wild pigs and deer from destroying the crops, hence the farmers manually spray the rotten egg solution on their fields, and firecrackers are wont to keep off the wild elephants that destroy the crops. The system is automatically depending on the need (i.e) there is no manual work, thereby saving time and also preventing the loss of crops. The problems faced due to the lack of forest surveillance are,

• Animal intrusion in human populated areas.
• Illegal entry of humans in the reserved forest area.
• Baby animals dies due to digging a pit.
• Due to 24 hours of electrified fence humans, animals and birds get hurts.

IV. WORKING OPERATIONS

This is the system which is of used to provide data regarding the anti-smuggling of the woods and the anti-intrusion of the wild animals nearer to the human occupied area this the system which comprises of the RFID system, Camera, Sensors, LDR Module, buzzer and concept of IoT.

Raspberry Pi is a microprocessor which is of used for the imaging processing of the subject captured by Camera. Thus they are used to identify the category of threat for the wildlife and to prepared for the respective precaution methods. Power Supply are used to convert the ac voltage supply into dc operating source for the respective level of dc source. Sensors pin is of used to detect the presence of the interference in the system, whereas the ultrasonic system is of used to detect distance between threat and the target. The Wi-Fi module is of used to connect and to communicate the data distorted in the IoT cloud server via the net connection. It provides a gateway between the user and raspberry pi thereby having an

uninterruptable internet connectivity. The GPS module is of used to detect the location of the incident occurrence and to navigate the respective officers for the spot of crime occurs.

V. OUTPUT ANALYSIS

The animal intrusion is the one which is of mainly used for the purpose of creating a fear on the vision of the animals by the sudden flickering of the light to avoid them from the coming nearer to the roadways or human settlement. This also helps them from getting hunting and injuries by humans. The buzzer is of located in the wild officer room to indicate the presence of the threats. In our paper, we have developed the smuggling prevention system using Raspberry Pi and IoT.
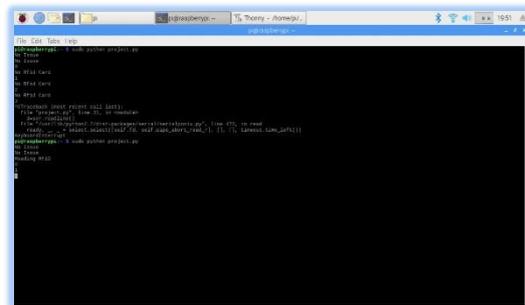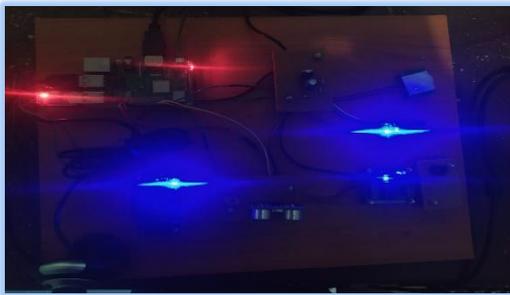
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VI. CONCLUSION

The problem of wild animals has become a major social problem in the current time. It requires urgent attention and an effective solution. Thus this paper carries a great social relevance as it aims to address this problem. Hence we've designed a sensible embedded farmland protection and surveillance based system which is low cost, and also consumes less energy. The main aim is to prevent and to protect the area from intruders and wild animals which pose a major threat to the agricultural areas. Such a system are going to be helpful to the farmers in protecting their orchards and fields and save them from significant financial losses and also saves them from unproductive efforts so they endure for the protection for their fields. This system will also help them in achieving the better crop yields and thus leading to their economic wellbeing.

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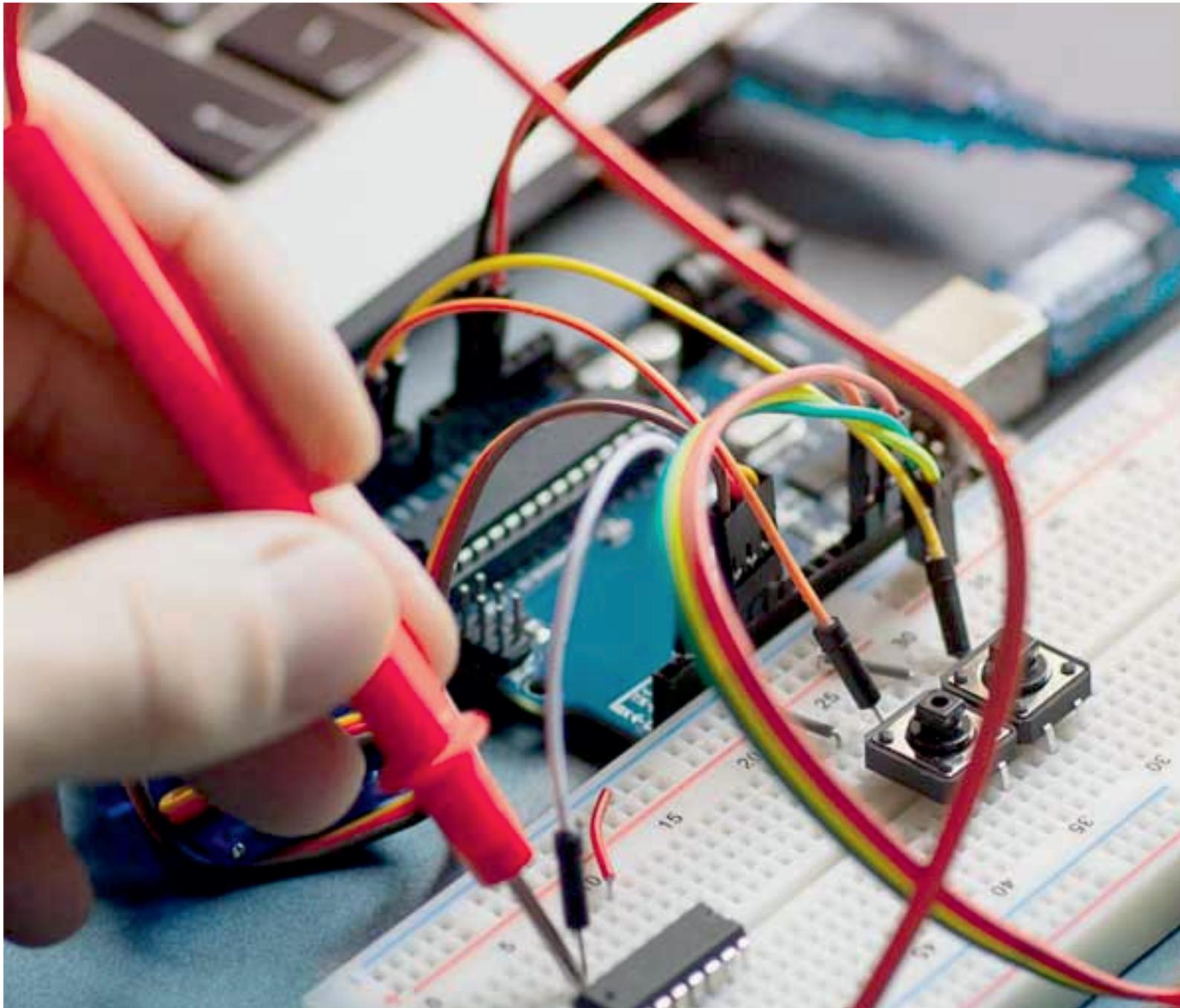
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