Chapter 9
Smart Crop Protection System From Wild Animals Using Artificial Intelligence

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ABSTRACT

The first major threat to the farmers is drought. Crop vandalization by animals is the second major threat after drought. Crops are vulnerable to animals. Therefore, it is very important to monitor the nearby presence of animals. The main aim of this project is to provide a better solution in order to resolve this problem. In this chapter, the authors proposed a method which could detect the presence of animal and offer a warning. They used a microcontroller and camera to detect the movement of animals, and send signal to the controller. It diverts the animal by producing sound; and, further, a signal is transmitted to GSM which gives an alert to the owner of the crop immediately. The proposed monitoring scheme is to provide an early warning about possible intrusion and damage by animals.

1. INTRODUCTION

Economy of many countries is majorly dependent on agriculture. Agriculture plays a major role in the economic development of a country. Agriculture is the main stay of

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economy which contributes for the gross domestic product. Agriculture is the major source to meet the food essentials and requirements of the people. It also provides raw materials to the industries. But due to animal interference and fire incidents in agricultural lands, huge loss of crops is experienced by the farmers. To avoid the financial losses, it is very crucial to protect the agricultural fields and farms from animals. Our proposed work we have designed a system which prevents the entry of animals inside the farm by using LDR and Camera. The purpose of the designed framework is to develop intruder alert to the farm, so as to avoid the losses incurred due to animals and fire.

These alerts given by the proposed framework, protects the crop from damaging which in turn increase yield of the crop. The developed system will not harm or injure the animals as well as human beings in any form. Aim of the presented framework, is to design an intelligent security system which protects the farms with the aid of Embedded system which is based on Arduino as shown in Figure 1,2 &3. Due to the lack of of any detection system, these attacks kill villagers and destroy their crops as well. The villagers are left helpless to their fate due to absence of security measures. Therefore, a need for a proper detection system is raised, which could help and save their lives and also preserve the crops.

Several crops & paddy fields cannot always be fenced.

With the best utilization of mobile communication technology, the main objective of this paper is to utilize global system for mobile communication (GSM) and use short message service (SMS). This system helps us to provide surveillance functionality and keep away wild animals from the farm.

Several solutions followed by the framers so as to minimize the loss of crops is discussed next. It is found that the smell of rotten eggs prevents the wild pigs & deer from entering in to the farm and destroying the crops. The farmers use the rotten egg solution spray on their fields to prevent the entry of pigs and deer into the farm. Firecrackers are used to frighten and ward off the elephant.

The framework, along with providing protection from wild animals, distinguishes between an intruder and authorized person with the aid of RFID's and various LDR sensors.

These are deployed in the frame area to sense and detect any motion and turn's ON the camera when movement is detected, thereby providing real time monitoring.

Several methods are automated to suppress and prevent the wild animals from entering the farmlands and destroying the crops, such as electronic fire a rotten egg spray, to ward off the wild animals. The framework employs Haar feature which is based cascade classifiers to detect the object and distinguish between animal and human.

a) Animals coming near the field
b) Sound alert for animal entry

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