

Solar Electric Fencing for Irrigation of Animal Man Conflict

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ABSTRACT

This paper introduces fundamental concepts of electric fence technology, presents a new design method for a livestock electric fence energizer circuit. India, with vast agricultural lands has different crops ranging from paddy to tomato. But few crops are destroyed due to animal attack and hence a protection is required to save the crops from animal. In this proposed work, we design and implement Fencing Perimeter Protection for agriculture. It is the modern day need to save the crop from wild-life animal. It works on Solar Energy with backup facility to run uninterruptedly during the nights as well as cloudy days. when any object is sensed by PIR or IR sensor, Immediately controller sends the message to the authorized person through the IOT technology, and it is interfaced with the controller. If the object touch to the wire then the shock given to them and buzzer will on continuously until the object pass away from the wire. Its applications suits remote areas provide an economical and practical solution to achieve maximum protection of field or particular areas.

Keyword — IOT, sensor, fence, agriculture, buzzer.

I. INTRODUCTION

Electric fences can be used to protect farmhouses, farmlands, forest bungalows, etc. from animals. In a way, these simulate the job of a cowboy or forest guard. Already popular in countries where manpower is expensive, electric fences are slowly becoming popular in India as well.

Nowadays the use of electric fence for control and content livestock are having a large application in almost all countries of the world. Electric Fence was starting to use in the thirties and nowadays is used in all world in little and big farms. Brazil, like the major exporter of beef cattle is a great consumer of this technology. Big farms with large areas of control need electric fences energizers of large capacity to keep high voltage in all its extension. There are in Brazil many manufacturers of this kind of equipment, but these manufacturers use empiric rules to design this kind of equipment. This work intends to be a starting point to change this reality involving the academic researchers in the study of this problem. The electric fence presents the following parts: Energizer, Wire, Isolation and Ground [1]. Agriculture in India is the broadest economic sector and plays a significant role in the overall socio-economic factor of India. The increasing news articles in television and newspaper on wild animals raiding agricultural crops during harvest season shows that these animals can destroy a farmer's livelihood. In such areas Electric fencing system can be employed in which the animals experience a high voltage low current shock for a very short time. Because of the small magnitude of current there is no threat to the animal's life at the same time the large magnitude voltage scares away the animals.

Usually, PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared", "Pyroelectric", or "IR motion" sensors. A photoelectric sensor, or photo eye, is a device used to detect the distance, absence, or presence of an object by using a light transmitter, often infrared, and a photoelectric receiver. They are used extensively in industrial manufacturing. There are three different functional types: opposed (through beam), retro-reflective, and proximity-sensing (diffused) [2]. The practices employed by farmers to deter elephants are also wide ranging. These generally include active traditional deterrents such as

shouting, drum beating, bursting firecrackers, torch lighting, and setting fire to raw jute or tires fixed at the end of bamboo sticks. Usually, farmers guard their crops on their own, however during peak raiding season two to three neighboring farmers form groups to ride animal back. Additionally, forest department officials may aid in mitigating human elephant conflict by firing shots in the air due to that more problems are faced by the officers.

II. Objective :

To protect the crop from wild life animals, fence energized circuit is design. Wirelessly control fence Energizer technology. System using IOT

III. Components:

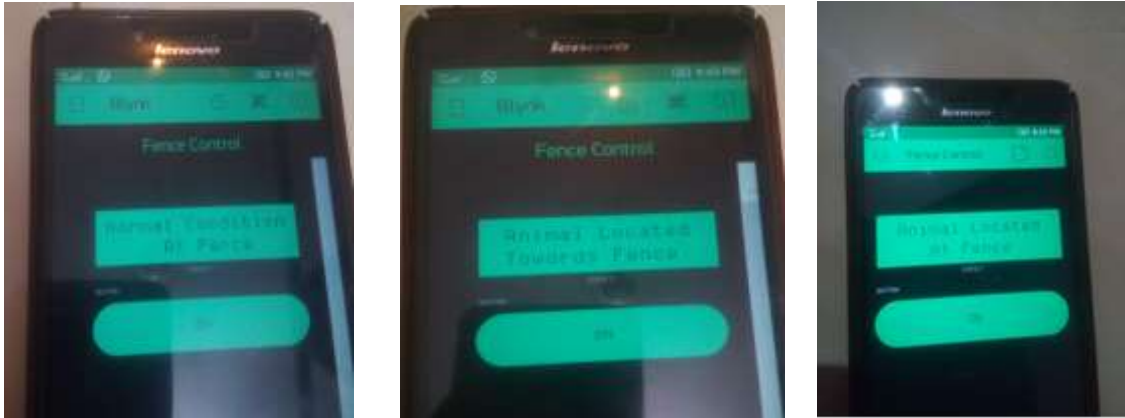
- a. **PIR Sensor:** PIR sensor is used for monitoring the Motion of animals and people which is fed to microcontroller. PIR sensor also detect the heat of body.
- b. **SOLAR Panel:** A **solar cell**, or **photovoltaic cell**, is an electrical device that converts the energy of light directly into electricity by the photovoltaic effect, which is a physical and chemical phenomenon. the output of solar panel is connected to battery.
- c. **Battery:** A battery converts chemical energy into electrical energy by a chemical reaction on. It is used in a circuit to power other components. A battery produces direct current (DC) electricity. Using the electricity from an outlet in a house or building is cheaper and uses less energy, but a battery can provide electricity in areas that do not have electric power distribution. It is also useful for things that move, such as electric vehicles and mobile phones
- d. **ESP 8266 WIFI MODULE:** ESP8266 is an impressive, low cost Wi-Fi module suitable for adding Wi-Fi functionality to an existing microcontroller project via a UART serial connection. The module can even be reprogrammed to act as a standalone Wi-Fi connected device—just add power

MODEL OF PROJECT



Construction and working principle:

Solar electric fencing circuit consist of microcontroller IC Atmega 328, PIR sensor WI-FI module ESP8266, Buzzer, voltage regulator IC 7805, IC7806, Ferrite core transformer, Transistor. It consist of 18W (i.e, 12V,1.5 mA current) Battery. In this we required 4000V DC for fencing. The transformer use here is step-up transformer which convert 12V of battery voltage into 4000V DC voltage. The capacitor used here which continuously store 4000V from fencing. The Wi-Fi module used here require 3.3V to operate so IC LM317 is use which convert 12V form battery into 3.3V. Microcontroller Atmega 328 require 5V to operate. So voltage regulator IC 7805 is use which covert 12V of battery into 5V for microcontroller. Fence energizer circuit require 6V supply. So IC 7806 is use which convert 12V into 6V. For fencing 4000V, Less than 50 mA current is use. PIR sensor detect the motion in 120 degree direction i.e upto 15 foot. It can detect the heat of human body. When any animal detect by PIR sensor then buzzer will alarm and we got the message that animal is located towards the fence and when any animal located at fence then buzzer will alarm and We got the message that animal is located at the fence.



Conclusion: The proposed work “Solar electric fencing for irrigation of animal-man conflict is designed such that it can be installed on any surface. It is much easy and cost effective than increasing the height of the wall. The proposed work is easily expandable and can be used by farmer to increase the security of the land from animals, and compatible with all types of additional security gadgets

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