

Passive Infrared (PIR) Sensor for Safe Agriculture

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Abstract— Agriculture is a cultivation of land and breeding of animals and plants to provide food, fiber, medicinal plants and other products to sustain and enhance life. Agriculture is a backbone of India, Which provides employment opportunities for rural peoples on a large scale in under developed and developing countries. To protect the crops from damage caused by animal as well as divert the animal without any harm. Due to less monitoring on crops led to the destruction in large scale .The proposed system we are developing a detector for safety measures of saving agriculture. Passive infrared radiation sensor detects the change in infrared radiation of warm blooded moving objects in its detection range and offer a warning through buzzer which makes sound due to this the field can be saved from the intruder and this signal is transmitted to GSM and which gives an alert to farmers. Arduino Uno is used to interface with PIR sensor. PIR sensor are excellent devices for wireless sensor networks being low-cost, low power and presenting a small form of factor. The proposed model we present feature extraction and sensor fusion technique that explodes a set of wireless nodes equipped with PIR sensors to track intruder moving into the field. Our approach has reduced computational and memory requirements. Moreover, this method is also designed in such a way that it lets any farmer can use this technique in a convenient way.

Keywords— PIR sensor, Arduino Uno, Buzzer.

I. INTRODUCTION

Agriculture is the science and art of cultivating plants and livestock. It is an important source of livelihood. Farmers use crackers, gun fires and loud sounds for scaring away the wild animals. Cost of labour is very high and affected the expenditure of farmer. So this can be solved by using motion detector. PIR Sensor for safe agriculture- The main aim of this paper is to build an easy way for the farmer to protect his field from intruders Moreover, the project is also designed in such a way that even in his absence the field can be protected by the buzzer sound .The main intention of this technique is that farmer should get message wherever he is about the intruder so that he can protect his field in his absence.

Every object connected to the internet for communication to become smart in IoT. Motion detectors are used as security systems in banks, offices and shopping malls, and now in agriculture as intruder alarm. The prevailing motion detectors can stop serious accidents by sensing the persons who are in close proximity to the detector.

Farmers in India face serious threats from pests, natural calamities & damage by animals/intruders resulting in lower yields. Traditional methods followed by farmers are not that effective and it is not feasible to hire guards to keep an eye on crops and prevent wild animals/intruders. Since safety of

both human and animal is equally vital. So, motion detection system is necessary in farm areas.Hence the objectives of this proposed model are to protect field from animals and intruder using motion detector. The system should assist the farmers in getting live data(entry of animals in the field) which is useful for the farmers to protect their field.

II. RELATEDWORK

Concept of Mechanical Solar Tracking system AmarGarg et al, reports a study of various types of solar tracking systems has been presented, of solar panels by keeping them aligned along with the sun position which is used only during daytime but cannot be useful during night.[1]

Haidi Ibrahim and Boon TattKoik proposed system using digital image processing mainly for locomotion behaviour of animals for animal detection. Using power spectral they are trying to test animal presence in the image will affect the power spectral or not. Using Fourier transform by transforming from spatial domain to frequency domain. The drawback of this method is that this method cannot be suitable for fast detection of animals. They have also mentioned one more approach which is Animal Detection Based on Thresholding Segmentation Method in which if the threshold is greater than a pixel of gray that value is set to white and others are set to black. The drawback of this

method is that this method that calculating threshold is difficult for periodically changing images.[2]

NidhiDaxini, Sachin Sharma, Rahul Patel stated that real-time animal detection system will reduce animal intrusion and collision using Viola and jone algorithm for facial feature detection. The video is taken from a camera and is converted into a frame. Positive images have detected animals and negative images have non- detected animals. Haar-like feature extraction method and later testing the classifier.

[3]So in this we are presenting practical procedure to ward them off, by creating a system which studies the behavior of the animal and human, detecting and creates the different sound that warns the animal /human and also alerts the authorized person by sending a message.

III. SYSTEM OVERVIEW

The proposed system consists of 3 main phases,The sensitivity,The central processing and Action

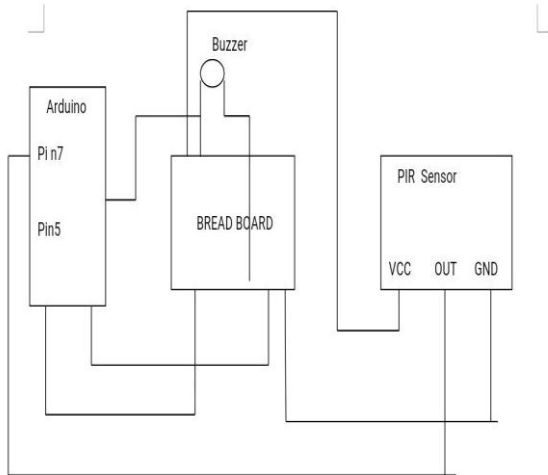


Fig. Arduino Motion Sensor System

Figure. 1 The Arduino motion sensor system.

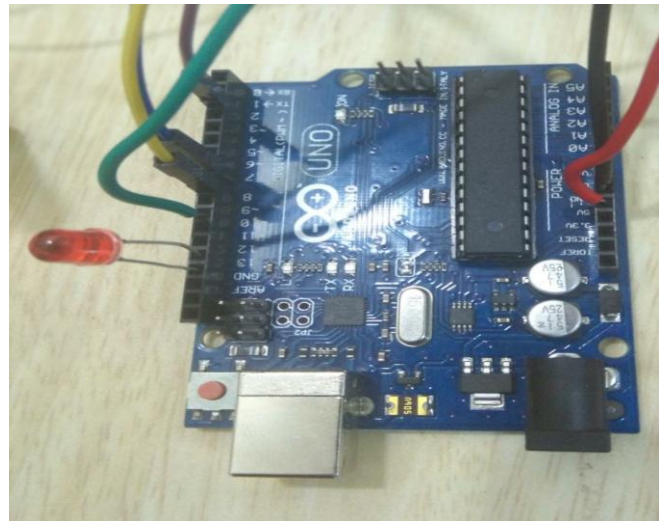
The block diagram of Arduino Motion sensor system to make a motion sensing alarm using an Arduino micro controller . Anti-Theft device detected motion from a moving object for those with body temperature like human being and animal.

IV.METHODOLOGY

The proposed system consist of following components

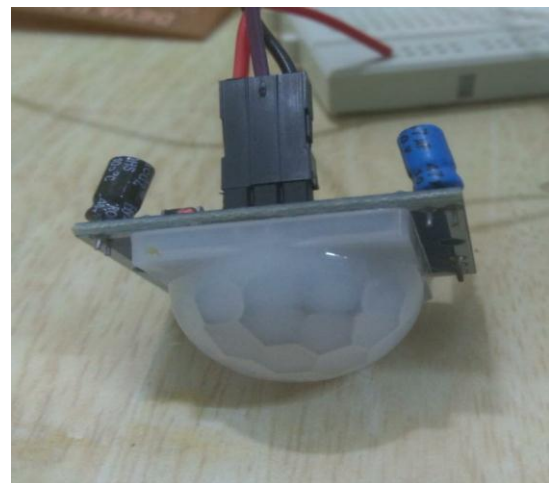
- a) Arduino Uno: It is a microcontroller board based on

the ATmega328. ArduinoUno is a microcontroller. It is an easy USB interface. It has a memory for storing the code and button to reset the code.



- b) PIR Motion Sensor:

PIR Sensors are generally used in home appliances, industries, agriculture etc. It consists of pyro electric sensor that detects the infrared radiation emitted from intruder.The PIR Sensor has three pins: On the left pin is ground which is to be connected to a ground pin.The other in the middle is out needs to be connected to a digital pin. On the right is vcc is to be connected to 5v.Wire it to your Arduino's digital pin 2 as the diagram shows.



- c) Buzzer:Buzzer is an alarm device used in sensor to create a noise when it detects the intruder.In the absence of owner near his field, it is protected by this device.The buzzer has 2 pins:- One is GND (needs to be wired to a ground pin on the Arduino). One needs to be connected to a digital pin.



d) Jumper Wires: It is an electric wire.

e) GSM module:

Used for mobile communication. **GSM module**, Connect the Tx pin to pin 9 of Arduino. Connect Rx to pin 10, Arduino - Vcc or Power Jack to +12 Volt, Make Ground pin common to all modules and other components.



f) LED pin:

The LED has two pins, the anode and the cathode. The Anode is longer and is always wired to positive voltage. The Cathode is shorter and always wired to negative voltage. Wire the Anode to pin 13, and the Cathode to the GND pin next to it.

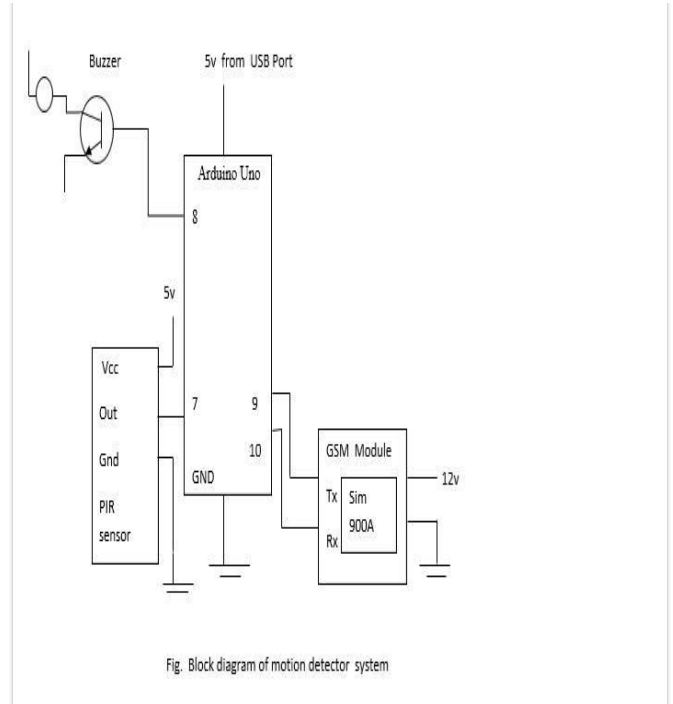


Fig. Block diagram of motion detector system

Figure 2 Block diagram of motion detector system

Above block diagram is the connection made between all the components. This is the motion detector sensor we designed for safe agriculture. This system would be user-friendly for the farmers.

V. RESULT

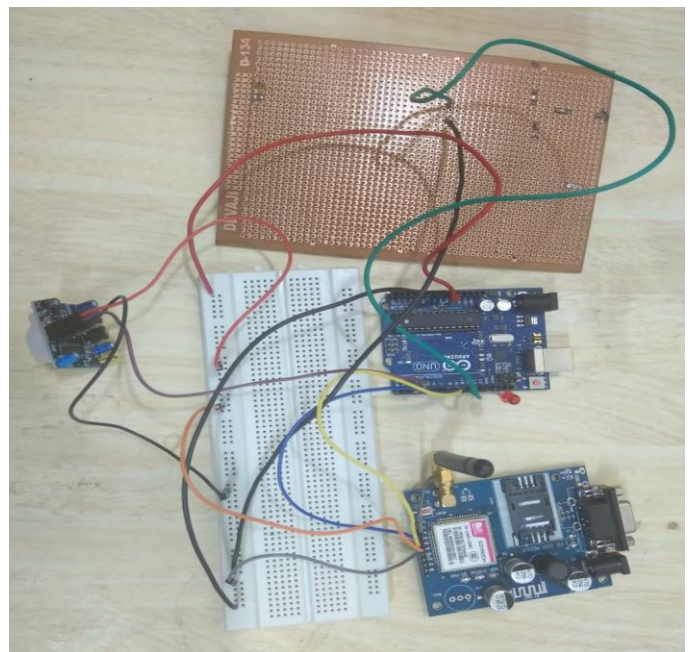


Figure3 Experimental setup

As shown as in figure 3 setup, Intruder detection part of the project entirely depended on both software and hardware. The PIR sensor responsible for the detection of motion adjusts itself to the infrared signature of its surroundings and keeps watching for any changes. In the absence of motion the LED indicator will remain dim and the program will continue updating the surroundings. If sensor detects movement and consequently the motion detection indicator will light up and sends message to the owner after the buzzer makes sound..,the hardware is interfaced with the sensors in the board. The board is inserted with a sim card which is used to communicate with the owner. Firstly we need to verify the program which is done using Arduino software. After that it needs to be uploaded. Now if the sensor, senses the motion the alarm makes the sound. Finally , motion sensors aren't just an additional feature of a security system - they are essential. Without sensors, there wouldn't be a way to detect intruders. The output denotes the first result is the intruder detection and makes a sound through buzzer and second result is the SMS send to the farmers.

VI. CONCLUSION AND FUTURE SCOPE

Precision agriculture has grown to meet increasing worldwide demand for food using technologies that make it simpler and cheaper to collect and apply data, adapt to changing environmental conditions, and use resources most efficiently. Although large farms have been the first to adopt these technologies , smaller farms are now able to benefit as well, using tools built into smart phones, relevant applications, and smaller sized machinery. In this proposed model we developed a farmer friendly agriculture system using various tools and sensors .The farmer need not to be tensed about the crops in field which is been protected now by PIR sensor. Thus information about PIR sensor should be available to the public so as to increase its implementation.

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