

Human and Animal Movement Detection in Agricultural Fields

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Abstract

The main aim of the project is to protect the crops from damage caused by animal as well as to divert the animal without causing any harm. Animal detection system is designed to detect the presence of animal and offer a warning. The PIR (passive infrared sensor) is to detect the movement of the animal and send signal to the controller. It diverts the animal by producing sound and signal further, this signal is transmitted to WIFI which gives an alert to farmers and forest department immediately. The notification message is sent to the mobile through the WIFI module. The sound system is to produce musical sounds like drums, crackers only when wild animals enter into nearby fields. The sounds are then detected to audio amplifier and it is then connected to the loud speakers. LDR (Light Dependent Resistor) sensors is for automatic turning on lights. Flame sensor is to detect the land from forest fire. This system is useful to monitor the area where humans cannot monitor always and this is the secure way to get the information.

Keywords - PIR Sensor, LDR Sensor, WIFI module, IOT, Flame sensor.

I. INTRODUCTION

The major aspiration of this proposal is to defend the crop field from wild animals. Wild animals are destroying the yield from many senility and preservation of the crop field. This causes the serious problem. Due to curtailment of food and water, wild animals will shift towards crop fields for the villages, which forge tremendous damage for the crop and annual wage of the farmers. To overcome this issues farmers need technical support, hence the project proposes technical solutions by using IOT (Internet of things) and WSN (Wireless sensor networks). A detector is used to identify animals when they enter near crop fields. The total model will be perfected using the micro controller integrated with the sensor, electrical and electronic components. Micro controller is also known as the heart of the entire system.

IOT is one of the modern accelerated advancement in computerization, which invented diversification of all asset across discovery, invigorating and

transportation through the median of network by penetrating itself, according to isolated addressing pattern; In further, the commodity are affiliated together as a outgrowth to make dignified authority. IOT is appreciably superior than M2M, wireless network, Radio frequency identification. It is also known as the assortment of system together.

II. REALTED WORKS

Chourey.SR Amale.P.A Bhawarkar.N.B [1] proposed Iot Based Wireless Sensors Network for Prevention of Crops from Wild Animals using sensors, controller, actuator. Raspberry Pi WSN is known as the heart of the system.

Savitha.M [2] Build up a general assistant prolongation with Smart Crop Field Irrigation using IoT for establishing the expansion of crops by tracking and administering the soil texture.

Nikesh Gondchawar, Kawitkar.R.S [3], introduced a general auxiliary plan that deals with smart agriculture modernism for present traditional approach of agriculture using smart GPS based remote controlled robot to perform tasks like paddle, sprayer, humidity sensing, fowl and mammalian petrify, keeping alertness, etc.

M. Sathish kumar et al, the security system is based on an embedded system along with GSM and sensor networks. The human movement is detected exploitation the PIR sensors. The system triggers AN alarm sleuthing the presence of person in an exceedingly specific interval of your time and at the same time sends what percentage persons an interloper via message to the SMS through GSM Modem. When the protection system is activated, the CCTV camera is activated. This highly reactive approach has low computational requirement. Therefore, its similar temperament for home closed-circuit television. This surveillance security system implemented using PIC micro controller, camera, GSM and sensors.

T. Gayathri et al, proposed the system for monitoring the growing status of the corn (maize) plant continuously and intimate the agriculturist using wireless sensor network (WSN). But in follow, cultivator faces too much effort in the farmland. This paper makes eases the work of the farmer in cultivated land through the usage of different kind of sensors. The two LDR sensors square measure interfaced with PIC16F877A microcontroller whereas its prime array receives radiation for provide current and also the bottom of the LDR array is for activity leaf area index (LAI). The humidity sensor will compute the moisture level in the corn field, if the level decreases, then it automatically switches ON the DC motor. All the particulars of farmland are sent to the farmer through GSM and revel in the LCD screen. The temperature detector can realize the intensity of warmth gift within the soil. PH detector is employed to seek out the soil pH scale that is important for plant nutrition.

III. PROPOSED SYSTEM

Our proposed work, we design a system to prevent the entry of animals into the farm and alert the farmer at the same time via an IOT. Our main purpose is to develop an inexpensive and prohibitive IOT to the farm to prevent losses due to animals. The developed system won't be harmful to animals. The sensors send the data to the microcontroller which turn on the alarm system which consists of sounds and damping lights. The microcontroller then informs the user by an automated notification using IOT. We use night vision camera to monitor day and night and also the data information can be stored in cloud database. It is also useful for monitoring environmental conditions like forest fire detections etc.

IV. SYSTEM ARCHITECTURE

A. Transmitter block

TX block is the main block of the project and it is kept in the agricultural land with PIR sensor, LDR sensor and flame sensor. These sensors are used to detect the motion of the animal, detection of forest fire and automatic turning on lights. AV camera is for live capturing of audio and video at the particular location of the animals. WIFI module which is configured with internet, is used to send the notification message to the farmer and forest department immediately.

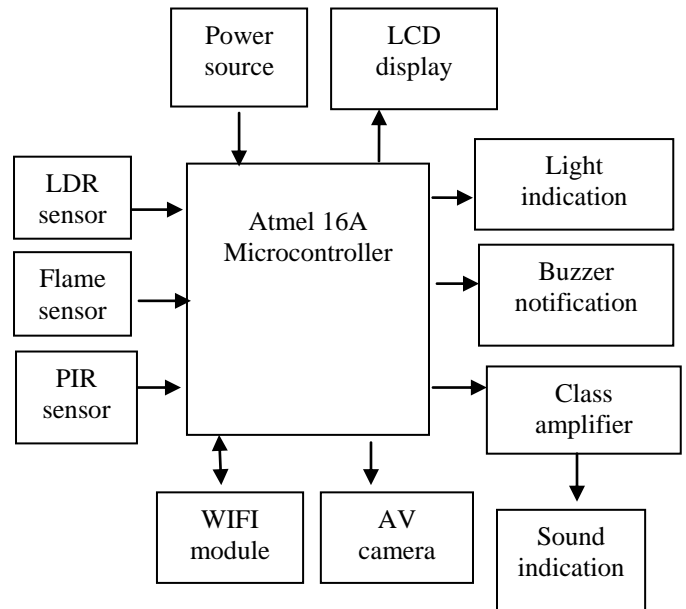


Fig 1: Transmitter Block

B. Microcontroller

This is a modified Harvard architecture 8bit RISC single-chip microcontroller. The capacity of the plan mind is mainly registered in the define about affecting accessory itself. It is the heart of whole system sensors will be integrated with it.

C. LCD display

A liquid crystal display is a empty-commission sample or other electronically tone visual resource this need affecting bright-inflect equity as regards running rock.

D. PIR sensors

PIR sensor see a human being emotional any which way inner just about 10m from the sensor. This is an ordinary profit, as the factual disclosure range is between 5m and 12m. PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiation. For numerous essential project or items that need to discover when an individual has left or entered the area. PIR sensors are absurd, they are complicate domination and essential battle, have a broad glass hearing, and are simple to crossing with.

E. LDR Sensors

Light abased resistors, LDRs or photo resistors act generally nearly new in journey location it is cardinal to expose the latency or the stable of light. When the level of light increases or decreases the light switches on automatically.

F. Flame sensor

A FLAME is a type of resister whose resistance is dependent on temperature, more so than in standard resistors. The world is a thermal and resistor. With NTC flame, resistance decreases as temperature rises.

G. Wireless camera

Good photographs can shoot on full manual all the time, but they also know when certain other camera modes can help out in tricky shooting situation. It will show live stream video.

H. Av camera receiver

An audio/video recipient (AVR) is a consumer televisions basic recycled in a at rest locale. Obtainable scheme bear television, monitor, or video projector although the inputs can originate from television, satellite receiver, radio.

I. Wifi

Wireless modules comes as plug and play devices by integrating all the necessary wireless hardware and software into a small form factor module which can be driven by the simple micro controller. WIFI module in this system provides the facilities for the farmers to alert message will be sent to their mobiles.

J. Receiver block

Receiver block is a control unit that receives the live capturing of audio and video at the particular location of the animal from the AV camera and it can be sent to the receiver module. The receiver module to connect TTL USB Adapter and it sends the audio and video images to the laptop monitor.

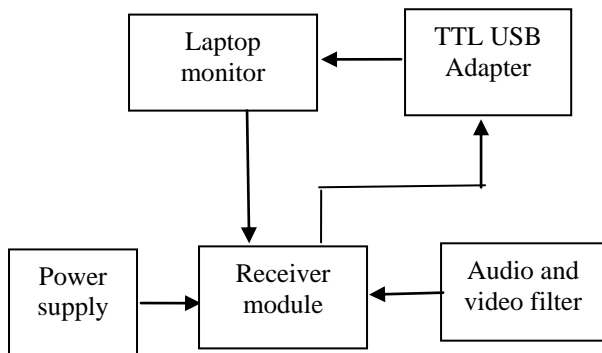


Fig 2: Receiver Block

K. Audio and video filter

An audio filter could be a frequency dependent electronic equipment circuit, operating within the audio vary, zero cost on the far side twenty kHz. Audio filters will amplify (boost), pass or attenuate (cut) some frequency ranges. A video filter could be a code part that performs some operation on a transmission stream. Multiple filters will brutalized in a series, referred to as a filter graph, in which each filter receives input from its upstream filter, processes the input and outputs the processed video to its downstream filter.

L. Receiver module

An RF receiver module gather affecting switch RF signal, and demodulates it. There area unit 2 sorts of RF receiver modules: super heterodyne receivers and super-regenerative receivers. Super-regenerative modules area unit typically low price and low power styles employing a series of amplifiers to extract modulated information from a radio radiation.

V. RESULT AND CONCLUSION

The scrape of crop dissolving by deserted animals procure become a determined issue for the cropper. Efficacious explanation and urgent attention is needed to solve this serious problem. To decode the problem of farmer we accept achieve a smart farmland provision entity with the help of IOT. The special aim is to obstruct the need of crops and confection the range from wild animals which motivation major suffering to the agriculture area. So our technical reaching will be helpful to the farmers in cover fields and save them from business deficiency and also saves them from useless efforts that they endure for the production of their fields.



Fig 3: Animal motion detection

PIR sensor see a human being emotional any which way inner just about 10m from the sensor. PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiation.

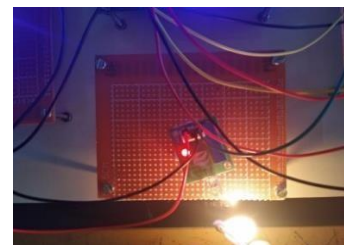


Fig 4: Fire detection

The flame is recognized at 433mhz beneath this range the flame isn't detected. When the flame is identified the alert is sounded and the recognition message is send to the flame station.



Fig 5: Light Detection

LDRs or photo resistors act generally nearly new in journey location it is cardinal to expose the latency or the stable of light. When the level of light increases or decreases the light switches on automatically.

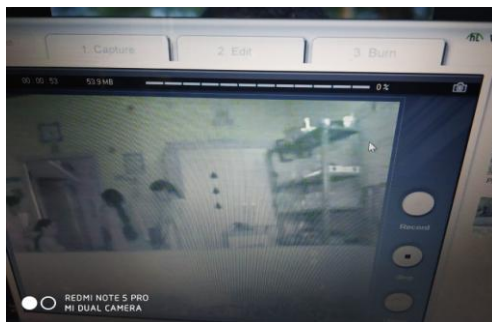


Fig 6: Laptop Monitoring

ACKNOWLEDGEMENT

I would like to thank to my project guide Asst.Prof.Dr.D.Geetha always being with presence & constant, constructive criticism to make this paper. I would also like to thank all the staffs of computer science department for their valuable guidance, suggestion and support through the paper work, who had given co-operation for the project with personal attention. At last I thank my friends, team members, colleagues for the inspirational help provided to me through a paper work.

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