

# A NOVEL ON MOTION ACTIVATED WILDLIFE RECORDING CAMERA USING RASPBERRY PI

Dr.S.Sumathi<sup>1</sup>, B. Mahesh<sup>2</sup>, V. Praveen<sup>3</sup>, C. Siva<sup>4</sup>, A. Ruf Ahmed<sup>5</sup>

Head of Department<sup>1</sup>, U.G. Scholars<sup>2,3,4,5</sup>, Department of Electronics and Communication Engineering,  
Adhiyamaan College of Engineering, Hosur, Tamilnadu, India.

ssumathi.aeri@gmail.com<sup>1</sup>, maheshramamoorthi@gmail.com<sup>2</sup>, praveenprasanth@gmail.com<sup>3</sup>  
sivachinpan@gmail.com<sup>4</sup>, rufahmed026@gmail.com<sup>5</sup>

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**Abstract** - A novel approach to performing of motion activated wildlife camera. Getting wildlife footage is a difficult task. Cameramen need to wait for hours or even days without moving to get desired footage. Here we propose an automated system with a motion activated recording camera that starts recording only when motion is detected. This has a lot of advantages. To get the right moments footage the camera needs to be kept in recording mode for entire days or nights. Well this system saves battery as well as storage as it only records footage when motion is detected.

**Key Words:** animals, Raspberry Pi, IoT, motion sensor, PIR sensor, camera.

## 1. INTRODUCTION

The project is aimed at evaluating the performance of an operating system on an embedded system. Before delving into its implementation, an introduction is needed to the parts involved in the project. The whole report is centered around the field of embedded systems and the use of Linux to run applications on them. Hence an introduction to Embedded Systems and using Linux as an OS in them is provided.

Surveillance is the process of monitoring the circumstances, an area or a person. This generally occurs in a military scenario where surveillance war areas and adversary territory is crucial to a nation's security. Human surveillance is accomplished by conveying work force close sensitive areas so as to continually screen for changes. People have their restrictions and organization in blocked off spots is not generally possible at all the time. There are also added risks of losing work force in the occasion of getting got by the adversary. With advances in technology over the years, however, it is possible to

monitor areas of importance remotely by using robots instead of human.

Apart from the obvious advantage of not losing any work force, physical and ethereal robots can detect subtle elements that are not evident to people by furnishing the robots with high resolution cameras and different sensors, it is possible to gain information about the particular location remotely.

Satellite communication makes it conceivable to speak consistently with the robots and acquire real time audio visual feedback. Thus in recent times surveillance technology has become an area of great research interest. Over the years the need for security and surveillance systems has changed significantly due to the influence of various events and attacks.

## 2. RELATED WORK

Various authors have proposed and discussed much advancement in educational field using technology that has helped in improving educational field.

[1] Azlan M.J., and D.S.K. Sharma "Camera trapping the Indochinese tiger", Panthera Tigris corbetti, in a secondary forest in peninsular malasiya, 2003. [2] Yong Xu, Research of "Image recognition technology about moving object using camera" in 2008. [3] Angela Antony , Prof. G. R. Gidveer , " Live Streaming Motion Detection Camera Security System with Email Notification using Raspberry Pi" IOSR Journal of Electronics and Communication Engineering (IOSR-JECE) 2013. [4] Kavin Abas, Caio Porto, Obraczka, "Wireless smart networks for the surveillance public places" IEEE, 2014. [5] Jesus Suarez and Robin R. Murphy, "Hand gesture recognition with depth images", IEEE, 2015. [6]. Aamir Nizam Ansari Mohamed Sedky, " An Internet of things approach for motion detection using

Raspberry Pi” Conference: Intelligent Computing and Internet of Things (ICIT), 2014

The motivation of project is in latest improvements in Wi-Fi and small sensor technological innovation have given base systems for considering enhancing effective modular systems. They offer the possibility of versatility in use, and system scalability. The Raspberry Pi has turned out to be ideal as the primary of such a system. Here we use ultrasonic sensor to detect the animal and within the range if any animal detected then immediately the motion camera will gets “ON” and it will captures the photos of that detected animals. If possible we try to implement the same idea with video capturing but here we go only for image capturing so that it could save the memory and power.

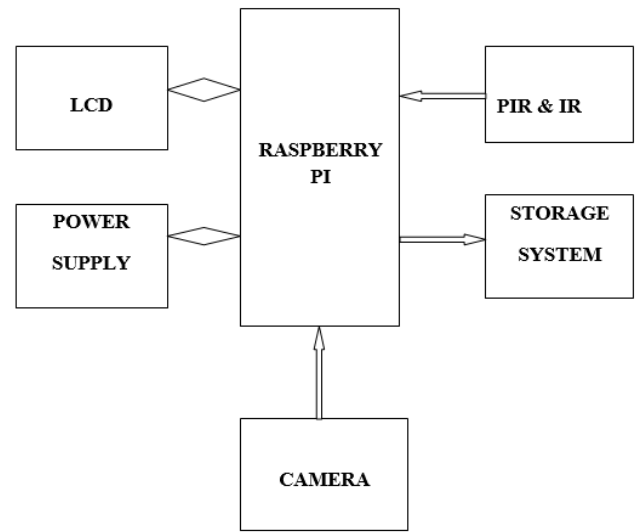
The process of monitoring the circumstances, an area or a person. This generally occurs in a military scenario where surveillance war areas and adversary territory is crucial to a nation’s security. Human surveillance is accomplished by conveying work force close sensitive areas so as to continually screen for changes. People have their restrictions and organization in blocked off spots is not generally possible at all the time. There are also added risks of losing work force in the occasion of getting got by the adversary. With advances in technology over the years, however, it is possible to monitor areas of importance remotely by using robots instead of human.

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### 3. PROPOSED SYSTEM

The main concept of this project is controlling web camera automatically based on sensor. Sensor will detect the animal in some range, when the range is reduced beyond threshold point then camera will turn on based on detection of animal. Then there is no animal available in prescribed range then web camera which is placed in the forest will not detect anything, when animal is available in the prescribed range then only camera will turn on, otherwise camera will not turn on. When immediately it detects the animals then camera will turns ON and it will captures the image and it will sends to prescribed email address.

### 4. METHODOLOGY



**Fig- 1:** Block Diagram

In this block diagram the PIR based animal detection system is described in simple words as following.

The main concept of this project is controlling web camera automatically based on PIR sensor. PIR sensor will detect the animal in some range, when the range is reduced beyond threshold point camera will turn on based on detection of animal. then there is no animal available in prescribed range then web camera which is placed in the forest will not detect anything, when animal is available in the prescribed range then only camera will turn on, otherwise camera will not turn on. When immediately it detects the animals then camera will turns ON and it will captures the image and it will sends to storage unit.

#### A.RASPBERRY DESCRIPTION

RASPBERRY is a family of instruction set architectures for computer processor based on reduced instruction set computing (RISC) architecture developed by British company ARM holdings.

A RISC-based computer design approach means ARM processors require significantly fewer transistors than typical CISC x86 processors in most personal. This approach reduces costs, heat and power use. Such reductions are desirable traits for light, portable, battery-powered devices including smart phones, laptops, tablet and notepad computers, and other embedded. A simpler design facilitates more efficient multi-core CPUs and higher core counts at lower cost, providing improved energy efficiency for servers. ARM Holdings develops the instruction set and architecture for ARM-based products,

but does not manufacture products. The company periodically releases updates to its cores. Current cores from ARM Holdings support a 32-bit address space and 32-bit arithmetic. The ARMv8-Architecture, announced in October 2011, adds support for a 64-bit address space and 64-bit arithmetic.

### B. LCD Display

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (*Hitachi*) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.

### C. Motion Sensor

This Passive Infrared Sensor (PIR) module is used for motion detection. It can be used as motion detector on your robot. It can work from 5V to 9V DC and gives digital output. It requires 10-60 seconds of settling time before starting its operation. It consists of pyroelectric sensor that detects motion by measuring change in the infrared levels emitted by the objects. It can detect motion up to 6 meters.

Pyroelectric devices, such as the PIR sensor, have elements made of a crystalline material that generates an electric charge when exposed to infrared radiation. The changes in the amount of infrared striking the element change the voltages generated, which are measured by an on-board amplifier. The device contains a special filter called a Fresnel lens, which focuses the infrared signals onto the element. As the ambient infrared signals change rapidly, the on-board amplifier trips the output to indicate motion.

### D. Camera

Cameras could be the next big thing in automotive safety. A properly implemented surround view system with cameras on front sides will guard against back over deaths as well as more commonplace damage when you scrape a fender. Camera will give you the feeling that you are having a pair of eyes in the back of your head. These small devices are usually placed on the external body of a vehicle and provide real-time video for the driver of anything which is happening outside.

This document describes the use of the three Raspberry Pi camera application. There are three application provided: raspistill, raspivid and raspistillyuv. Both raspistill and raspistillyuv are very smaller and are intended for capturing images, while raspivid is for capturing video.

### E. Passive Infra-Red Sensor

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.

### F. STORAGE SYSTEM

A USB flash drive is a data storage device that includes flash memory with an integrated USB interface. It is typically removable, rewritable and much smaller than an optical disc in very large environments with mainframes and minicomputers

USB flash drives are often used for storage, data back-up and transferring of computer files. Compared with floppy disks or CDs, they are smaller, faster, have significantly more capacity, and are more durable due to a lack of moving parts

### G. IOT

IOT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a Smart Grid Things, in the IOT, can refer to a wide variety of devices such as hear to monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, or field operation devices that assist fire-fighters in search and rescue.

These devices collect useful data with the help of various existing technologies and then autonomously flow the data between other devices.

### H. Operating System

Raspberry pi supports only operating systems. In we are using Linux OS.

This language was especially developed for creating the UNIX system. Using this new technique, it was much easier to develop an operating system that could run on many different types of hardware. The software vendors were quick to adapt, since they could sell ten times more software almost effortlessly.

Throughout the next couple of decades the development of UNIX continued. More things became possible to do and more hardware and software vendors added support for UNIX to their products. UNIX was initially found only

## 5. RESULT AND DISCUSSION

The system consists of a motion sensor with a camera and SD card circuitry /usb drive interfaced to a raspberry pi. The pi is used to process the sensor input to detect.

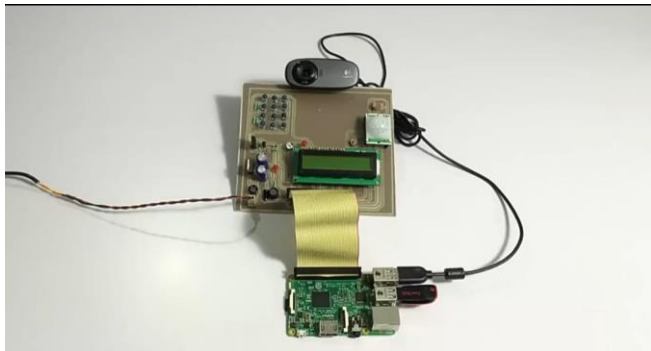


FIG 2: EXPERIMENTAL SETUP

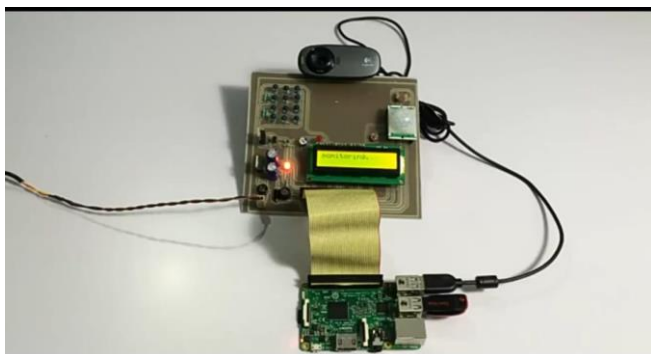


FIG 3 : OUTPUT

## 6. CONCLUSION

A system for implementing an economic and reliable wildlife motion activated camera is discussed. This project calibrates the design and construction of Wild Life Image Capturing with the help of motion and PIR Sensors. The design works to capture the images of any animal which is located at certain distance away from the implemented circuit and send it to a prescribed email address, thus saving storage memory and battery.

The camera recording is kept off if no motion is detected. As soon as motion is detected the raspberry pi records footage and sound of the motion and again stops recording when motion is not detected which is saved in the memory card for later viewing.

- We can also record the video of animals for further implementation.
- We can also use different software and imagery for detection purposes
- It can be also used for movable cameras.
- Live streaming can also be done for video capturing

## REFERENCES

- [1] Ba L. Javier and J. Y. Zhou, Wireless Sensor Network Security, vol. 1, IOS Press, 2008.
- [2] G. Ashton, F. Kawsar, D. Fitton, and V. Sundramoorthy, "Smart objects as building blocks for the internet of things," Internet Computing, IEEE, vol. 14, pp. 44-51, 2010.
- [3] S. Hilton. (2012, 14 January). Progression from M2M to the Internet of Things: an introductory blog. Available: <http://blog.bosch-si.com/progression-from-m2m-to-internet-of-things-an-introductory-blog/>
- [4] Y. Liu, "Study on Smart Home System Based on Internet of Things Technology," In Informatics and Management Science IV. vol. 207, W. Du, Ed., ed: Springer London, 2013, pp. 73-81.
- [5] Hassan, qusay (2011). "demystifying cloud computing." The Journal of Defense Software Engineering. (Cross talk) 2011 (Jan/Feb):16-21. Retrieved 11 December 2014.
- [6] Kuruvadi Praveen, Ankhith BalaVenkata, Department of Telecommunications BMS College of Engineering Bangalore, India "Modular Weather and Environment Monitoring Systems using Raspberry Pi" International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 IJERTV3IS090619 Vol. 3 Issue 9, September- 2014
- [7] Halfacree, Gareth. "Raspberry pi - The Model B." bit - tech. net. Dennis publishing limited. Retrieved 10 June 2013.

## BIOGRAPHY:



Dr. S. Sumathi,  
Professor and head,  
Electronics And Communication  
Engineering Department,  
Adhiyamaan College of Engineering,  
Anna University.