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Smart Surviellance Farm Monitoring System Using Raspberry PI

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ABSTRACT:

This study aimed to investigate an establishment using an Intelligent System which employed an Embedded System and Smart Phone for chicken farming management and problem solving using Raspberry Pi and Arduino Uno. An experiment and comparative analysis of the intelligent system was applied in a sample chicken farm in this study.

The findings of this study found that the system could monitor surrounding weather conditions including humidity, temperature, climate quality, and also the filter fan switch control in the chicken farm. The system was found to be comfortable for farmers to use as they could effectively control the farm anywhere at any time, resulting in cost reduction, asset saving, and productive management in chicken farming.

PROJECT INTRODUCTION:

Agriculture is the worldwide prime occupation of human being, 64% of total available land is occupied by the agriculture, and it consumes 85 % of fresh water. This figure of water consumption increases every year due to globalization and population growth. There is a challenge in front of every country to sustain the fresh food requirement and reducing the farm water consumption.

From last decade, few existing system working for reducing the agriculture water consumption, but these systems have some limitations. So, the modern technology is necessary to resolve this problem and support better irrigation management. The primary point of this paper is to screen and control the environment.

EXISTING METHOD:

Implementation:

This study is executed ARM11 Raspberry pi and Arduino created sheets interfaced with Temperature, Humidity and Air quality sensor. The components of the automatic farming system on Raspberry Pi Model-B and Arduino Uno are demonstrated. The system can notify using a real-time alarming system to smart phones reporting such as the current and daily highest/lowest temperature, humidity, and weather quality of the farm surroundings. Users can also control the filter fan switches and customize the notification system to the smart phone.

A. USB Camera: USB Camera captures the image and sends it to the USB port of the Raspberry Pi board. The camera model used here is USB Camera model 2.0.
B. Raspberry Pi Raspberry Pi is a small computer board working on the Linux operating system which connects to a computer monitor, keyboard, and mouse. Raspberry Pi can be applied to a electronic structure and programming network work, it can also served as a personal computer and Apache Webserver, MySQL could be installed in the board.
C. Arduino Arduino is an open-source microcontroller compatible with developed platforms. The controller appears not to be expensive and uses low electrical power, 5.5 volts. C and C++ were employed for this development. Arduino can connect to a computer via the Universal Serial Bus (USB) and perform with compatible connected accessories in both analog signal and digital signal.

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D. Gas Sensor module The module works as a Air Quality Detection Gas Sensor, this is sensitive to gas dangerous to human, applied to measure NH3, NOx, Alchohol, Benzene, CO, and CO2. The module is also used for controlling weather conditions and air cleaners in buildings. The measurement unit is presented in a analog signal.

E. Photosensitive sensor module (LDR) A light sensor was used for measurement of light intensity especially for naked eye light, its unit is called Lux [8]. Light Dependent Resistor (LDR) is a light sensitive resistance changing electronic resistance when there is a light incidence, called Photo Resistor or Photo Conductor.

Description:

This study proposes to examine a foundation utilizing an Intelligent System which utilized an Embedded System and Smart Phone for chicken cultivating administration and critical thinking utilizing Raspberry Pi and Arduino Uno. The discoveries of this investigation found that the framework could screen encompassing climate conditions including dampness, temperature, atmosphere quality, and furthermore the channel fan switch control in the chicken ranch. The framework was observed to be agreeable for ranchers to use as they could successfully control the homestead anyplace at whenever, bringing about cost lessening, resource sparing, and gainful administration in chicken cultivating.

Equipment:

ARM11, Arduino Temperature Sensor, Humidity Sensor, LDR Sensor, Air Quality Sensor, Camera

Programming:

OS: Embedded Linux, Language: C/C++, IDE: Qt Creator.

Block Diagram:

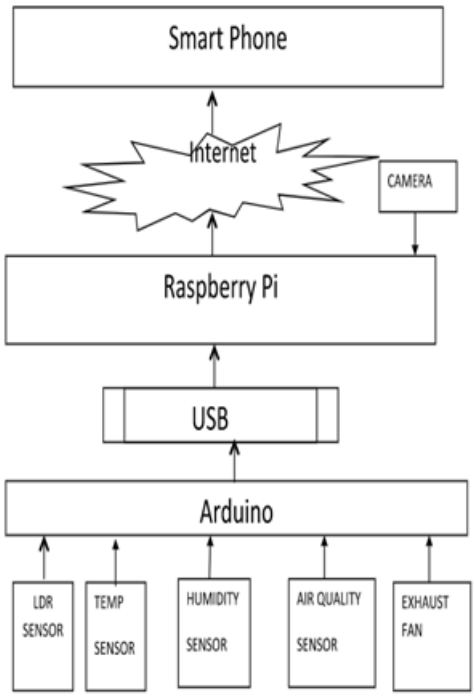

Fig. Proposed block diagram

EQUIPMENT COMPONENTS

Raspberry Pi Basic Hardware
Working System in SD Card
As the RPi has no interior mass stockpiling or inherent working framework it requires a
Keyboard and Mouse
Display
Power Supply
Cables
Video link choices:
HDMI-A link
Internet Connectivity

Applications:

Remote device control, automated control of home appliances, Surveillance.

Advantages:

As ARM11 CPU is used, future modification is done easily according to our need. It can be modified & can be applied to other automation applications also.

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RESULTS:

In this paper, the model developed has led to a trial in the environment and climate of a chicken farm, using the default configuration notifications.

Fig. Connection Of USB Camera With Raspberry Pi

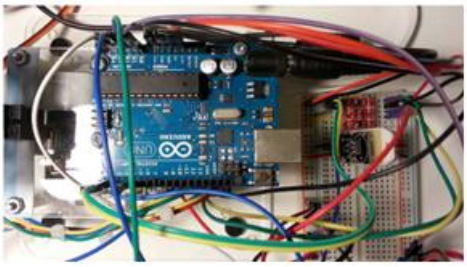


Fig. Arduino interfacing with sensors

STEPS TO INSTALL RASPBIAN OS

In order to install Raspbian OS,first next out of box software(NOOBS) has to be installed. 1.First step is to allocate the drive for installing OS

2. SD adaptor can also be used for this purpose

3. Download WINDISK 32 utility from source forge project which is a zip file

4. Extract and run the zip file

5. Select the file and click run as administrator

6. Select the image file which was extracted above

7. Select the drive letter of the SD card in the device box

8. Click write and wait for write process to complete

9. Exit the image and eject the SD card.

Fig: Installed Raspbian OS

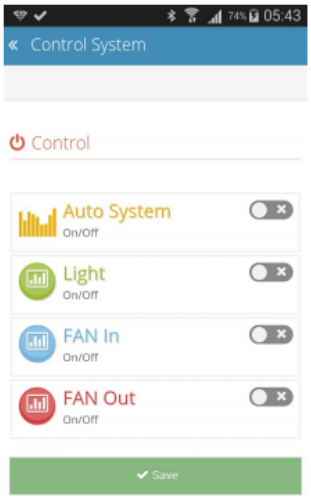
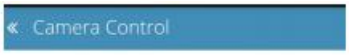


Fig.: Screen control system.

As Shown in figure, the control system displays the controls of lights and fans. By selecting Shutdown, the system will be automatic and turn control the device by itself.



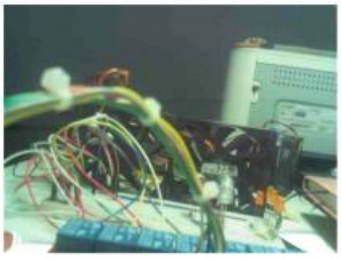


Fig. Streaming through camera

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FUTURE SCOPE:

The cost of ARM11 is more that's why in future we can implement this system using ARM CORTEX A8, Beagle bone etc as well as updated processors with high frequencies will work fine. As the storage space is also less in future we can also record these live streaming data by connecting external memory storage. We can complete our project using wireless technology. In future we can provide more security to data by using encryption, decryption techniques.

CONCLUSION:

The project "Smart Surveillance Farm Monitoring System Using Raspberry Pi" has been successfully designed and tested. It has been developed by integrating features of all the hardware components and software used and tested. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit.

Secondly, using highly advanced ARM 11 Processor board and with the help of growing technology the project has been successfully implemented.

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