Emergency Detection and Monitoring Daily Routine of Cattle using IoT

Vijayashree B. R.
Department of ECE
Sambhram Institute of Technology
Bangalore-97

Simran
Department of ECE
Sambhram Institute of Technology
Bangalore-97

Sunilkumar R.
Department of ECE
Sambhram Institute of Technology
Bangalore-97

Sheetal C. Medhavi
Department of ECE,
Sambhram Institute of Technology
Bangalore-97

K. Ezhilarasan
Department of ECE,
Sambhram Institute of Technology
Bangalore-97

ABSTRACT

Todays life human can’t imagine their life without technology. The era has modified and developed many projects such as advanced cattle health monitoring system using pic microcontroller and IoT. The system collects x,y,z axis acceleration data through triaxial accelerometer. The intention of this research is to establish a relationship between dairy cattle diseases with various non-invasive sensors for the development of a health monitoring system. Based on cattle health monitoring system critical parameters affecting cattle health which includes body temperature, respiration, humidity, heart-beat and ruminating continuously monitored. ESP8266 Wi-Fi module is used as transceiver. LM-35 is used temperature sensor to monitor the body temperature of the cattle. Two number of ADXL335 accelerometer sensors are used in this wearable device for lameness detection and alerting during pregnancy. MQ-02 smoke sensor is used for detection of smoke level in cattle farm environment. Infrared Red sensor is used for count the occupancy level of cattle in farm for smart lighting and smart ventilation purpose.

Keywords
IOT,PICMicrocontroller,ESP-Wifimodule,sensors, 3-axial acceleration.

1. INTRODUCTION

Now a days food features is not only decided by the overall environment and security of the ending product but also by the animal’s welfares status by which the food is produced. When we will develop the animal’s health on that time it will affect the quality of product, pathology and safety [7]. The financial and common activities of human culture is very important in developing countries where many people depends on livestock based activities and this livestock production will stay for many years. The interest in monitoring cow’s behavior for automated detecting estrus or unhealthy motion has steadily grown in recent years. In particular, large-scale dairy operations require an efficient automated heat detection system to accurately determine when the cows are ready for insemination. Accurate detection of estrus behavior for breeding on dairy farms is essential to dairy profitability as missed estrus periods cost dairymen. Many technologies have been attempted to detect estrus behavior in cattle with varying success. However, not all of commercial devices developed for automated heat detection and wireless data transmission provide required information such as activity level, traveling rate, and distance traveled of a cow. A smoke detector or smoke alarm is a device that detects smoke and issues an alarm to alert nearby people that there is a potential fire. Smoke detectors can work by optical detection (photoelectric) or by physical process (ionization), but some smoke detectors also utilize both types of detector to increase the sensitivity to smoke. In this paper, enhancement done on already available photoelectric smoke detector circuitry by integrating some distinct features like wireless technology, SMS sending through GSM module and fire extinguishing vehicle [4]. This features increase the safety and reliability of the smoke and fire detection technology.

2. LITERATURE SURVEY

[1] Amruta Helwatkar et.al., [Anshul Awasthi, Daniel Riordan and Joseph Walsh] proposed non-invasive sensor technology for the development of diary cattle health monitoring system. This research is to establish a relationship between dairy cattle diseases with various non-invasive sensors for the development of a health monitoring system. The aim is to consider the nature of the diseases a cow may have and relate it with one or many sensors that are suitable for accurate measurement of the behavioral changes. This proposed research uses ontological relationship mapping or ontology matching to integrate heterogeneous databases of diseases and sensors.

[2] Toufiqul Islam, Syed Asif Abdullah, and Golam Sarowar proposed enhanced wireless control system for smoke and fire detection. It describes the design and engineering of a wireless control system for smoke and fire detection with alarming provision, sms sending and fire extinguishing by a vehicle. It make use of PIC microcontroller for the controlling of the system.

[3] David Hanson and Changki Mo proposed monitoring cattle motion using 3-axil acceleration and GPS data. This paper examines feasibility of a cattle monitoring device that can sense, record, and wirelessly transmit the 3-axis acceleration and global positioning system (GPS) data of the cow for accurate and timely monitoring. The device is intended to use for estrus detection by interpreting the measured data to identify cow’s behavior and act. This proposed research is to automate estrus detection for artificial insemination, but the capability to track the cow’s motion characteristics may provide dairy operators with the capacity to assess the cow’s behavior and act to improve the overall well-being and health of the cow. It makes use of GPS.
A wireless cattle health monitoring system is required to analyze stress level of cattle with reference to THI (Thermal Humidity Index). The ATmega16 controller and ZigBee has been used to develop the wireless sensor and receiver nodes. LabVIEW is used as a real time data logger for monitoring the output of various sensors over the PC.

Additionally, a gaining unit obtain the data and industry is an integral part of the world economy. The continued production of quality beef requires new and improved methods for long term monitoring of animal health. Additional benefits can be realized from this class of technology, such as the ability to identify the presence of disease early and thereby prevent its spread. An important element of health assessment is the ability to monitor vital data such as core body temperature. It make use of wireless sensor network and GPS

The Advanced cattle health monitoring system is divided in to three main units as shown in the Figure 1 that will interact with each other to provide actual period observing, processing and recording. They are data gaining unit, Data administering unit and Data interact unit. Data gaining unit mainly consist of body temperature sensor, respiration sensor, humidity sensor, heart beat and rumination sensor with interfacing to PIC microcontroller. The data gaining unit obtain the data and makes it accessible for the data administering and data interact unit. The sensors are allowed for simple and general automatic measurement of numerous health factors. Such health sensors will be mounted on the cattle body, which continuously observe the body issues of the cattle like body temperature, respiration, humidity etc. and delivers output in the type of electrical signs. These signs are then compared to a standard limit of normal values set as the starting point in the data administering unit. The main function of this unit is when the animal will suffer from disease people use to take that animal to the doctor for diagnosis but sometimes doctors will not be available in hospitals so using this advance monitoring system we can sense the various activities of animals like body temperature, respiration , humidity etc. and we can send the animal health data to the doctor mobile using ESP8266 WIFI module. It will reduces the human effort. It will save the cattle life. Improve the quality of output. It will continuously monitor the cattle health parameter. We can use this system in poultry farms. We can use this system in Cow farms. We can use this system in Sheep farm. We can use this system in Sericulture farm.

The proposed system provide a solution for electrical power wastage also the manual operation of the lighting system is completely eliminated. The proposed system provide a solution for energy saving. This is achieved by sensing and approaching a vehicle using an IR transmitter and IR Receiver couple. Upon sensing the movement the sensor transmit the data to the microcontroller which furthermore the Light to switch ON .Similarly as soon as the vehicle or an obstacle goes away the Light gets switched OFF as the sensor sense any object at the same time the status(ON/OFF) of the street light can be accessed from anywhere and anytime through internet.

3. PROPOSED MODULE

The Advanced cattle health monitoring system is divided in to three main units as shown in the Figure 1 that will interact with each other to provide actual period observing, processing and recording. They are data gaining unit, Data administering unit and Data interact unit. Data gaining unit mainly consist of body temperature sensor, respiration sensor, humidity sensor, heart beat and rumination sensor with interfacing to PIC microcontroller. The data gaining unit obtain the data and makes it accessible for the data administering and data interact unit. The sensors are allowed for simple and general automatic measurement of numerous health factors. Such health sensors will be mounted on the cattle body, which continuously observe the body issues of the cattle like body temperature, respiration, humidity etc. and delivers output in the type of electrical signs. These signs are then compared to a standard limit of normal values set as the starting point in the data administering unit. The main function of this unit is when the animal will suffer from disease people use to take that animal to the doctor for diagnosis but sometimes doctors will not be available in hospitals so using this advance monitoring system we can sense the various activities of animals like body temperature, respiration , humidity etc. and we can send the animal health data to the doctor mobile using ESP8266 WIFI module. It will reduces the human effort. It will save the cattle life. Improve the quality of output. It will continuously monitor the cattle health parameter. We can use this system in poultry farms. We can use this system in Cow farms. We can use this system in Sheep farm. We can use this system in Sericulture farm.
4. CONCLUSION
Proposed system will provide the farmers with good efficiency. The farm is fully protected. The microcontroller will control the overall process taking place in the farm. The cattle body temperature and moisture level is sensed with the help of sensors and the values are displayed with the help of an LCD display. The overall process is under the control of microcontroller. We can expect total automation in cattle farm and it will leads to increasing the productivity. It is a wearable hardware gadget which will monitor the cattle’s health parameters and it will take some necessary action in some critical conditions. We will get all the data from website for further analysis. Smart ventilation system improves cattle health by preventing environment to reach critical. Smart ventilation and smart lighting saves consumption of electricity which leads to save a lot of money. This system saves time and maintenance costs for the farmer ensuring improved cattle health and high yield.

5. REFERENCES