Farm Animal Location Tracking System Using Arduino, GPS and GSM

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ABSTRACT

Every living creature has equal importance in this ecosystem. But the lives of the animals are in danger. Because animals usually have a habit of walking freely in the farms and forests, if any accidents or any mishaps happen to the animals in the farm or forest no intimation will be available.

If they got any injuries or any other sickness which causes death. In that situations farmer or forest officers may not know the location of the animals in that kind of big areas. In order to avoid this problem, we have implemented the concept of animal tracking using GPS and getting messages using GSM.

Keywords: GSM, GPS-based animal tracking

I. INTRODUCTION

To approach the issues in farm animal and to understand the complicative relationship of animals with their surroundings, the GPS tracking system is introduced by tagging the animal with radio transmitters and receiver to locate easily. An application that needs real time, fast, and stable data processing is a GPS-based animal tracking. GPS is one in various of the technologies that are utilizing in an infinite number of applications today. This tracking system can tell you of the location and route travel by the animal, which information of an observed from the opposite remote location. It includes the web application that provide you with the precise location of the device. This method enables us to trace the objective in any climatic condition. This method uses GPS & GSM technologies. The easiest way for tracing the animals in on the earthly system almost like GPS has presented. This method enables simultaneous tracking of a huge number of animals with transmitters that are light weighted, long-standing, more precise and economical than the any other automated positioning transmitter. With developments in technologies, there has been an increase in the usage of animal tracking system. The design of animal tracking system enables the displays of an animal's position on google maps.

II. EXISTING SYSTEM

A radio tracking system for animals in the vhf method can be explained by taking the base station into consideration. This base station can be used to broadcasts coded signal to a radio collar once every 20 seconds. Then pager inside collar receives signal and activate the LORANC receiver. The LORAN-C (Long

Range Aid to Navigation) and these signals can be received from three different locations to the animal. Radio transmitter inside collar rebroadcasts LORAN-C signals to relay station. And this relay station is used to receives and retransmits signals back to the base station. Finally base station computers and displays location on computer monitor, and stores coordinates on the hard drive. By this way the location of animal can be identified. This method an easy way of tracking animal and having the disadvantage of finding exact location is difficult. It shows three different locations in between those we have to search with kilo meters.

III. PROPOSED SYSTEM

To track the location, we are using GPS and GSM for wireless communication. In this project we are using GPS for the live location tracking. GPS will get the values from the satellites. GSM is used for getting the messages regarding location of animals. LM35 Temperature sensor is used to temperature values of the animals. If the animal has fever or if there are some wounds on animal body and because of wounds temperature of animal rises, then it sends SMS to the forest officer so, he can give immediate attention.
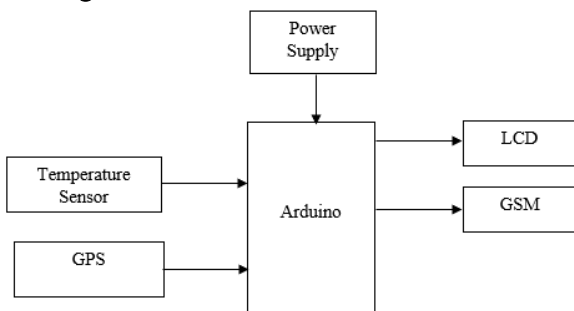
Block Diagram:

Fig1: Block Diagram

IV. HARDWARE REQUIREMENTS

Arduino:

Arduino UNO is based on an ATmega328P microcontroller. It is easy to use compared to other boards, such as the Arduino Mega board, etc. The board consists of digital and analog Input/Output pins (I/O), shields, and other circuits.

Fig2: Arduino

The Arduino UNO includes 6 analog pin inputs, 14 digital pins, a USB connector, a power jack, and an ICSP (In-Circuit Serial Programming) header. It is programmed based on IDE, which stands for Integrated Development Environment. It can run on both online and offline platforms.

LCD:

16×2 LCD is named so because; it has 16 Columns and 2 Rows. There are a lot of combinations available like, 8×1, 8×2, 10×2, 16×1, etc. But the most used one is the 16*2 LCD; hence we are using it here.
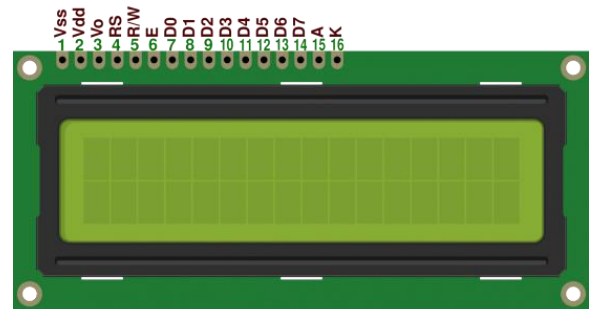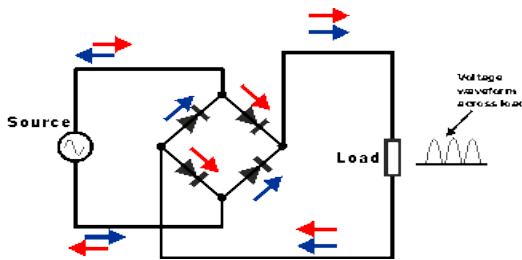

Fig3: LCD

Power Supply:
Transformer:

Fig4: Transformer

Transformer is a device which reduces A.C current into required D.C current.

Bridge Rectifier:

Fig5: Bridge rectifier

Fig6: Bridge rectifier circuit

A diode bridge is a technique of four diodes in a bridge circuit arrangement that provides equal polarity of output for mutually polarity of input. While used in its maximum shared application, for transformation of an alternating-current input into a direct-current output, it is called as a bridge rectifier.
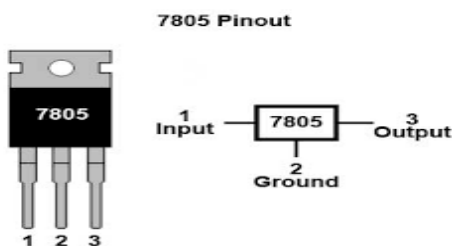
Capacitor:

Fig7: Capacitor

A capacitor could be a passive two terminal eletrical component that stores current in a electric field. The result of this can be termed as capacitance.
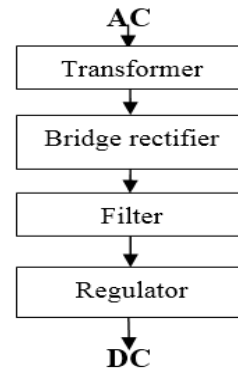
Regulator:

Fig8: Regulator

A voltage regulator IC keeps the output voltage at a continuous value. 7805 IC is one of the IC of 78xx family. It maintains fixed linear regulators which is used to maintain fluctuations.

Flow chart of power supply:

All the above components are used to convert AC voltage to DC voltage.

LM35 Sensor:

LM35 converts temperature value into electrical signals. LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 requires no external calibration since it is internally calibrated. The LM35 does not require any external calibration or trimming to provide typical accuracies of $\pm1/4°C$ at room temperature and $\pm3/4°$Centigrade over a full –55 to +150°C temperature range.

Fig9: LM35 Temperature Sensor

GPS:

Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. GPS is also known as Navigation System with Time and Ranging (NAVSTAR) GPS. GPS receiver needs to receive data from at least 4 satellites for accuracy purpose. GPS receiver does not transmit any information to the satellites.

Fig11: GSM

I. SOFTWARE REQUIREMENTS

Arduino IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.
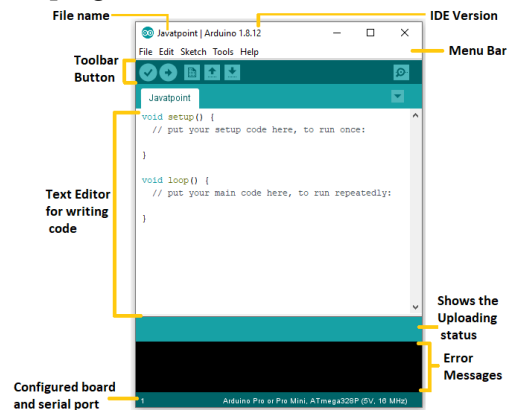

Fig10: GPS

GSM:

GSM speaks to Global System for Mobile Communications. It is a standard set made by the European Telecommunications Standards Institute (ETSI) to depict traditions for second time (2G) automated cell frameworks used by PDAs.

A Modem is a gadget which modulates and demodulates signals as per communication requirements. It converts an analogue carrier signal to digital signal and also converts such a carrier signal to required information.

Fig12: Arduino IDE Window

V. WORKING OF THE PROJECT

The working of this device looks like complex, but it's working can be understandable easily. When the animal faces any sickness, or attacked by any other animal/human the body temperature of the animal raises slightly from its normal temperature. The device gets activated when the body temperature raises from its normal temperature. Then the Arduino tracks the location of the animal and gives the location to the mobile with the help of GSM. If we want to track the location of the animal without

happening of above-mentioned conditions then we send an SMS from our mobile to GSM then the Arduino tracks the location with the help of GPS and sends it to our mobile through an SMS

VI. ADVANTAGES

- This system is fast and convenient when compared to other system.
- This does not require human attention as it is completely self-independent and automated system.

VII.APPLICATIONS

- Wildlife animal tracking to track the animals in the forest and in national parks
- We can use it for domestic purpose to detect the pet animals. In criminal cases many times we see that police department uses dogs to find the criminal, so this system can be used in such situations.

VIII. RESULTS

The below show figure is the device that is attached to the neck of the animal, made as a tracking collar. The below show figure is the device that is attached to the neck of the animal, made as a tracking collar.
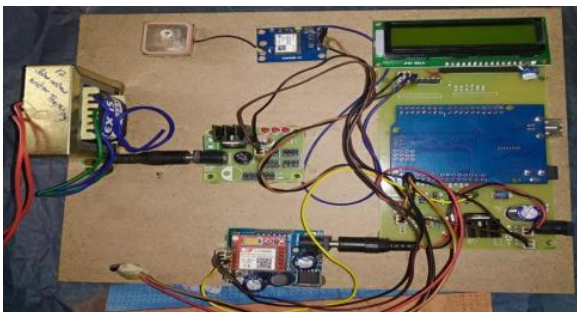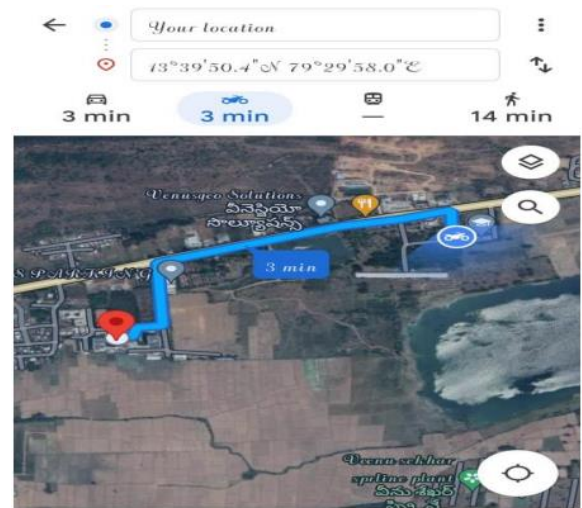

Fig13 : Animal tracking device using Arduino, GPS & GSM

The LCD continuously displays the body temperature of the animal, and when the animal body temperature is exceeded than 35c then the Arduino sends the location of the animal to the mobile of the animal owner.

Fig14: The LCD displaying the body temperature of the animal

Fig15: Location of the animal found through Arduino GPS & GSM tracking device

IX. CONCLUSION

There are many animals that are in danger of extinction because of many reasons. So as a result of that, we develop this project to make it easy to track and monitor the movement and vital signs (body temperature) of animals, to protect the animals from any danger that could happen. The project will send a message for the responsible person that contains the longitude and latitude and the body temperature of the animal, through that the responsible person can

behave quickly in case that the animal is in danger to save the animal life.

X. REFERENCES

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