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A GPS Based Novel Bull Tracking System for Jallikattu

T.R.S.Muthukumaar[1], P.Narasimman[2]
[1]Chief Executive Officer, Kings College of Engineering, Thanjavur, India
[2]Assistant Professor, Dept. of Electrical & Electronics Engineering, Kings College of Engineering, Thanjavur, India

Abstract— **In this paper an efficient bull tracking system is designed and implemented for tracking the movement of bull from any location at any time is discussed. The proposed framework made great utilization of prominent innovation that consolidates a mobile application with a microcontroller. The system works on Global Positioning System (GPS) technology for tracking. Arduino microcontroller is used to control the GPS and SIM908 Quad-Band GSM / GPRS module which combines GPS technology. The tracking system uses the GPS module to get geographic location coordinates at regular time intervals. The GSM module is used to transmit and update the bull location to a database. The Google Maps API is used to display the bull location in the mobile of the client.**

Index Terms—**Bull Tracking, Global Positioning System, GSM module, Arduino**

I. INTRODUCTION

Jallikattu is a customary spectacle in which a bull is relinquished into a horde of people, and numerous human participants endeavor to grab the large hump on the bull's back with both arms and hang on to it while the bull endeavors to elude [8]. An innovation is used to determine the area of an escape bull utilizing distinctive techniques like GPS and other navigation system working by means of satellite and ground based stations. The GPS/GSM based system is a standout amongst the most vital frameworks, which incorporate both GSM and GPS innovations. It is fundamental due to the huge number of uses of both GSM and GPS frameworks and the wide use of them by a huge number of individuals all through the world [1]. In [2], a vehicle tracking system is installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper is proposed to design a bull tracking system that works using GPS and GSM technology. This framework is based on embedded system, used for tracking and positioning of bull by using Global Positioning System (GPS) and Global System for Mobile Communication (GSM). This design will continuously watching the movement of bull and report the status on demand.

II. PROPOSED SYSTEM

This paper demonstrates a contemporary Bull Tracking System (BTS) use GPS technology to monitor and locate bull anywhere on the earth. Tracking system is tagged in the horn of the bull that provides efficacious real time location and the information can even be

stored and downloaded to a mobile. This framework is an essential contrivance for bull tracking whenever the proprietor needs to screen it. The information gathered can be viewed on electronic maps via internet and software.

The device incorporates contemporary hardware and software components that avail to track and locate bull both online and offline. A tracking system involves for the most part three sections bull-horn unit, fixed based station and database with software system.

The bull-horn unit incorporates the hardware part that is the Arduino, GPS and GSM modem kept in the horn of the bull like a band that is to be tracked. The unit is mainly predicted on a modem that receives signals from the satellite with the help of GPS antenna. This modem then converts the data and sends the bull location information via SMS as well as a mobile application named "BTS" which is synchronized with the web page and to a server which can be displayed on digital mapping [3][4].

Fixed based station comprises of a wireless network system that receives and transfer the information to the data center. The based station contains software and geographic map helpful for finding the bull. Maps of every city are accessible in the based station that has an in-built Web Server.

Database and Software are utilized to give the area that is the directions of each meeting point that is spared in the database, which can be later exhibited in a screen utilizing Google maps.

III. METHODOLOGY

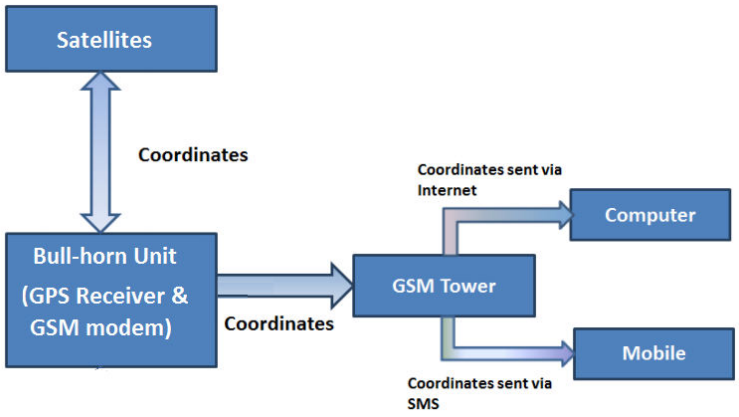


Fig.1 Block Diagram of Bull Tracking System (BTS)

The block diagram of bull tracking system appears in fig.1. Tracking system is fitted in the horn of the bull that will be tracked. The GPS receiver receives the direction from the satellite which is then send to the GSM tower by the GSM modem. The direction is then sent to a PC through internet where it is stored in the database for showing the location on Google map. The client can likewise observe the location of the bull in a mobile phone, when the client sends an SMS to the GSM modem in the Bull Tracking System (BTS), the GSM modem send another

SMS back to the client with the direction of the location of the bull along with a Google map link.

IV. HARDWARE IMPLEMENTATION

The heart of the framework is Arduino Uno microcontroller [7]. To begin with, worked on getting geo directions i.e. latitude and longitude [5]. Second, this made use of the GPS module to capture the area, speed and time of last received information in accordance. At that point utilizing GSM technology, the captured information already sent to the web server is stored and for this SIM908 module is used.

(a) (b)

Fig.2 (a) Arduino Uno R3 and (b) SIM 908 Module

Fig.2 (a) shows Arduino Uno R3 and (b) shows SIM 908 Module. BTS is made up with Arduino Uno R3, SIM908 module including GPS and GSM antenna. The core part of tracking system is microcontroller Arduino Uno. The geo location of a bull can be captured through GPS receiver and that information will be transmitted to the web server by utilizing GSM technology. That information will be stored in a database. For observing the location of the bull on the map and had built up a web application. It made up this web application with PHP, HTML and JavaScript using XAMPP software. For storing the location information, a text file had been used. It had likewise developed a mobile application to view the location of bull in a mobile phone by using Android Studio.

The SIM908 module is initialized to begin gathering geo location information from the satellite; device initialization is done using AT commands and incorporates GPS and GSM module; to turn on the GPS, first it is powered on and put in reset mode. At that point the module becomes ready for receiving location coordinates from satellite. The GPRS is next turned on; the process includes GPRS power on, setting APN of service provider, initiating HTTP protocol, and setting protocol method (Get method). Device initialization process may take up to 1 minute to worm up and calculate the precise position. In the event of network un-accessibility, the acquisitioned GPS coordinates and other information such as time and speed are stored

transitorily until the network returns back to service then the stored coordinates are sent with their time stamp and speed. Fig.3 shows the flow chart for GPS coding.

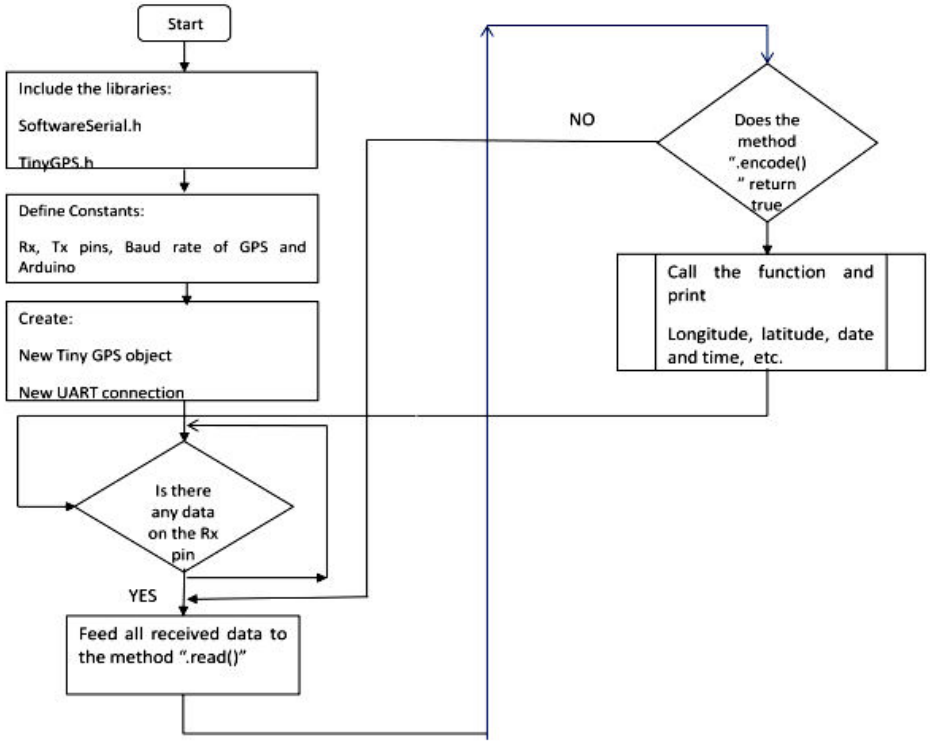


Fig.3 Flowchart for GPS coding

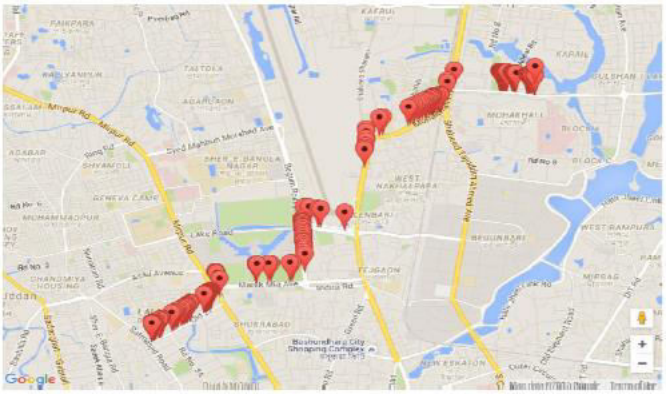
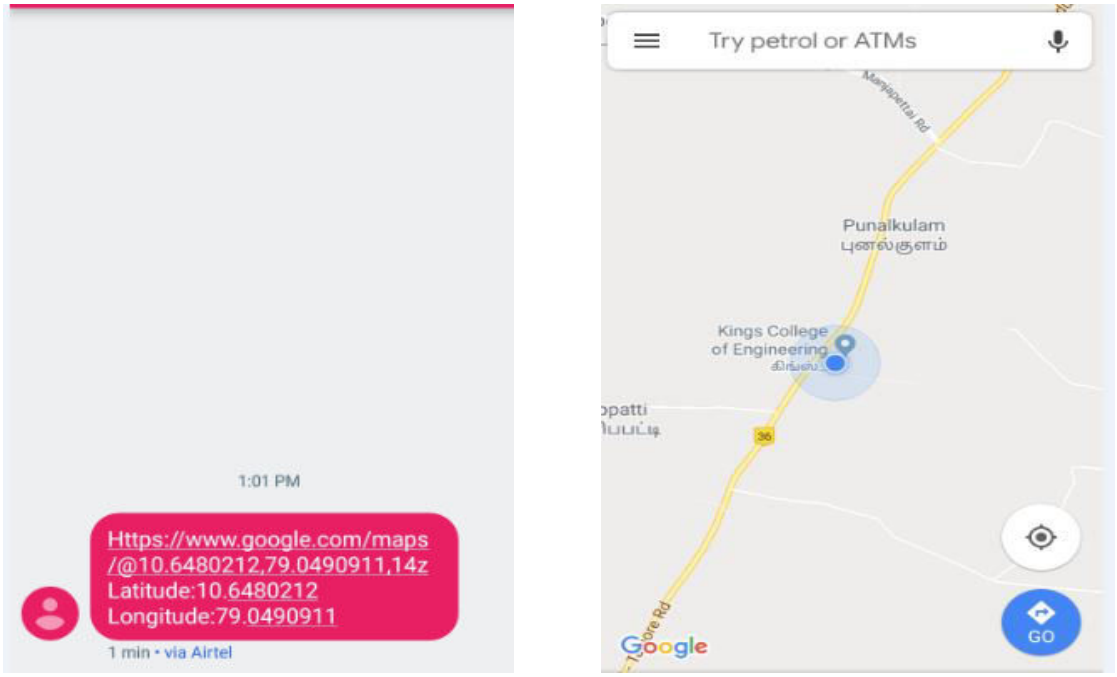


Fig.4 View of location of bull on website through Google map

For observing the bull location, an addition feature is included which will send SMS to the client according to client request. SMS will be included the value of latitude and longitude of the bull. A link is also appended with SMS, so that the client can visually perceive the location by using Google map [6]. Fig.4 shows the View of location of bull on website through Google map



(a) (b)

Fig.5 (a) SMS with a Google Map Link (b) View of the bull location

V. CONCLUSION

In this paper GSM modem was configured, tested and implemented the tracking system to observe the bull location via SMS and online on Google map. The Arduino is the brain of the system and the GSM modem is controlled by AT commands that enable data transmission over GSM network while the GPS provide the location information. Whenever the GPS receives a new information it is updated in the database and hence the client is able to see the location on the Google map. This system provides accurate information in real time that makes it possible for the client to track the bull not only in jallikattu and also in grassing situations. Fig.5 (a) and (b) shows the real time SMS with a Google Map Link and view of the bull location. This system can be implemented for other livestock also. This framework is easy to make and economical. By adopting VLSI technology in future, the overall system size gets diminished.

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