



FMB SHIP TRACKING USING IOT WITH CLOUD APPLICATION

(FISHER MAN BORDER SHIP TRACKING USING IOT WITH CLOUD APPLICATION)

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Abstract—Fishermen whose main source of income is fishing will always confront security challenges and life-threatening situations in nations with the International Marine Time Boundary Line (IMBL). Despite the fact that a peninsular nation, such as India, has its boundary limit in the ocean, residents of these coastal regions rely on fishing for a living and cross borders owing to ignorance or a lack of information about their country's boundary limit. Fishermen's lives remained challenging in such conditions. They may face gunfire and attacks from the opposing Navy; at the conclusion of the attack, fishermen are apprehended and their boats are confiscated. As a result, by leveraging cutting-edge technology such as the Global Positioning System (GPS) and the Global System for Mobile Communication (GSM), our article is intended to prevent such mishaps and to notify fishermen about border regions well in advance. This study also shows how this technology may be used to detect natural dangers and obtain ocean meteorological data for fishermen's safety.

Keywords: IMBL, GPS, GSM, host navy.

Introduction

The detection of illegal immigration and automated carriers presents the military with a lot of issues. Until recently, the computer processing power required for these

jobs was prohibitively expensive and frequently difficult to transport in the wild or in transportation. However, with the introduction of compact, powerful computers, military acquisition difficulties can now be solved at a lower cost. Illegal immigrants endanger India's security. A few years ago, the Border Indian Border Force attempted to restrict illegal immigration. Because the Border Security function has grown in size, it has become increasingly impossible to monitor all aspects of the border at all times. The degree of the constraints, as well as techniques for creating illegal immigrants, such as building tunnels and underground routes to circumvent existing security measures, all contribute to this predicament.

Despite the availability of some automated border monitoring devices, Patrol simply lacks the resources to monitor all Border areas of the border at all times. Furthermore, existing techniques are more expensive, and many old methods, such as the telephone, have proven ineffectual. As a result, a border monitoring and tracking system should be created. This program should automatically detect and notify post-border posts without forcing users to constantly monitor live video feeds. This information must be made in a timely manner for it to be effective, as immigrants who drive a car or a speeding watercraft across the border are at risk. This program should automatically detect and notify post-border posts without forcing users to constantly monitor live video feeds. This notification must be made in a timely manner for it to be effective, as immigrants who drive a car or a swift watercraft across the border go faster. Furthermore,

when integrated with infrared cameras, the system should be able to detect subsurface conduits as ground temperature change.

Fisherman Border Ship Tracking Using IoT with Cloud Application is an innovative technology that promises to enable real-time monitoring and tracking of fishing vessels operating along maritime boundaries. With rising demand for seafood, illicit fishing practices have proliferated, threatening marine life and jeopardizing the livelihoods of genuine fishermen. This system tracks the position, speed, and other important metrics of fishing vessels using IoT sensors and delivers the data to the cloud for analysis. The cloud-based tool offers authorities with an easy-to-use interface for monitoring and managing the actions of fishing vessels in real time. This technology will aid in the promotion of sustainable fishing practices, the prevention of illicit operations, and the protection of the marine ecology.

I. COMPONENT DETAILS

A. *ESP32* - Espressif Systems Programmable 32-bit Microcontroller

the esp32 is a low-cost low-power system-on-chip soc microcontroller with built-in wi-fi and bluetooth capabilities that is commonly used in applications such as internet of things iot devices home automation robots and industrial control systems the esp32 chip has two main processing cores a 32-bit xtensa lx6 cpu and an ulp ultra-low power co-processor as well as various processors such as adc dac spi i2c i2s uart pwm and capacitive touch peripherals sensor wifi and bluetooth functionality is implemented via dedicated modules and the chip also supports various wireless protocols such as (BLE BREDE) and wifi direct.

The ESP 32 chip has two main processing cores a 32-bit xtensa lx6 cpu and a ulp ultra-low power co-processor and various processors such as adc dac spi the ESP 32 has gained popularity due to its low cost ease of use and versatility it can be programmed with various programming languages and development platforms such as arduino micropython and esp-idf espressif iot development framework wi-fi and bluetooth support enable a wide range of applications such as wireless sensors smart home devices and wearable electronics.

B. *Arduino IDE*

The Arduino IDE is a software development tool for writing, developing, and uploading code to Arduino microcontrollers. The Arduino IDE is free and open source, featuring versions for Windows, Mac OS X, and Linux. The Arduino IDE provides a simple interface for programming Arduino boards in C. It includes a code editor, a serial monitor for debugging and communication with the board, and a library manager for easily adding third-party libraries to your project. It also includes a compiler and uploader, making it popular with both beginners and experienced users.

The Arduino community has developed a variety of libraries and examples that can be easily accessed through the Library Manager or downloaded from the Arduino website. This makes it easy to find and use code for different projects and applications.

C. *Power Supply*

This is a straightforward method for obtaining a 12V and 5V DC power source from a single circuit. To obtain the requisite voltages, the circuit employs two integrated circuits (ICs) 7812 and 7805. To produce a stable DC level, the transformer will step down the AC mains voltage, rectify it with a bridge, and filter it with a capacitor. The 7812 adjusts this voltage to achieve a constant 12V DC. The 7805 will control the IC1's output to maintain a consistent 5V DC at its output. This method yields both 12V and 5V DC.

D. *GSM Module*

A GSM Module is essentially a SIM 900 GSM Modem attached to a PCB with various forms of output taken from the board, such as TTL Output (for Arduino, 8051, and other microcontrollers) and RS232 Output to interact directly with a PC (personal computer). The board will also include pins or facilities for connecting a microphone and speaker, as well as +5V or other power and ground connections. These kind of provisions varied between modules3.

There are numerous GSM modem and GSM Module It is always best to use an arduino compatible GSM Module - that is, a GSM module with TTL Output provisions - for our project of connecting a gsm modem or module to Arduino and therefore sending and receiving sms using Arduino. Options available on the market.

1. We use a SIM900 GSM module, which means it can communicate in the 900MHZ band. We are from India, and the majority of mobile network operators in this country use the 900MHZ band. If you are visiting from another country, you must first determine the mobile network band in your location. The majority of mobile networks in the United States operate in the 850MHZ band. Please read the Wikipedia page about GSM frequency bands throughout the world for more information.

2. Examine the power requirements of the GSM module - GSM modules are manufactured by many companies. They each have their own specs for the input power supply. You should double-check your GSM modules' power requirements. In this instruction, our GSM module requires a 12 volt input. As a consequence, we powered it using a 12V, 1A DC supply. I've seen GSM modules that require 15 volts as well as ones that just require 5 volts. They differ according to the manufacturer. If you have a 5V module, you can power it directly from the Arduino's 5V out. GSM Modules are created by attaching a certain GSM modem to a PCB and then providing provisions for RS232 outputs, TTL outputs, Mic and Speaker interfaces, and so on. The most popular modem under use is SIM 900 gsm modem from manufacturer SIMCom. They also manufacture GSM Modems in bands 850, 300 and other frequency bands.

3. Look for TTL Output Pins in the Module - You can only feed data from the gsm module straight to the Arduino if the module has TTL output pins. Otherwise, you must convert the RS232 data to TTL using the MAX232 IC before feeding it to the Arduino. The majority of gsm modules on the market have TTL output pins. Just make sure you get the appropriate one.

E. *GPS MODULE*

GPS (Global Positioning System) navigation module NEO-6MV2. The module simply calculates its position on Earth and reports its longitude and latitude. It is a standalone GPS receiver driven by the high-performance u-blox 6 positioning engine. These adaptable and cheap receivers offer a variety

of connection options in a tiny (16 x 12.2 x 2.4 mm) package. Because of its small design, power, and memory options, NEO-6 modules are ideal for battery-powered mobile devices with strict cost and space constraints. Its unique architecture delivers great navigation performance even in the most challenging environments.

Following the circuits, you must match the baud rate of the controller to the module; otherwise, an error will occur. After you've selected the baud rate, you can read serial data directly from the module. This data will consist of longitude and latitude values, which the user can manipulate as desired.

Because the raw values provided by the module are difficult to read directly, a simple decimal computation can be performed in programming to obtain easy-to-read values.

F.Relay

A relay is a type of electrical switch. Many relays employ an electromagnet to mechanically activate a switching mechanism, although different functioning modes exist.

Principles are also employed. Relays are employed when a circuit must be controlled by a low-power signal (with perfect electrical isolation between the control and controlled circuits) or when numerous circuits must be controlled by a single signal. The first relays were used in long-distance telegraph circuits to repeat signals from one circuit and retransmit them to another.

A relay will switch one or more poles, each of which connections can be thrown by one of three methods:

Normally-open (NO): while the relay is engaged, these contacts link the circuit; while the relay is inactive, the circuit is detached. It is sometimes referred to as a Form A contact or "make" contact. NO contacts are also known as "early-make" or NOEM contacts because they close before the button or switch is fully engaged.

Normally-closed (NC): while the relay is engaged, these contacts disconnect the circuit; while the relay is inactive, the circuit is connected.

Form B contact, often known as "break" contact. NC contacts are sometimes known as "late-break" or NCLB contacts because they remain closed until the button or switch is fully disengaged.

Transition (CO): These contacts regulate two circuits: one generally open and one ordinarily closed with a common terminal.

A Form C contact is sometimes known as a "transfer" contact ("break before make"). If this form of contact employs "make before break" capabilities, it is referred to as a Form D contact

G. Blynk App

The Internet of Things inspired the development of Blynk. It can remotely operate devices, display sensor data, store data, visualise it, and do a range of other exciting things.

The platform is comprised of three major components:

- Blynk App - allows you to create visually attractive interfaces for your projects by employing the numerous widgets we provide.
- Blynk Server - handles all smartphone-to-hardware interactions. You have the option of using our Blynk Cloud or setting up your own private Blynk server. It is open source, capable of managing thousands of devices, and can even operate on a Raspberry Pi.

- Blynk Libraries - for all common hardware platforms - enable server connectivity and execute all incoming and outgoing commands.

Consider this: every time you touch a Button,

Consider this: whenever you hit a Button in the Blynk app, the message is sent to the Blynk Cloud and mysteriously finds its way to your device. It works in the reverse direction as well, and everything happens in the blink of an eye.

II.Related work

Every day, fisherman face new obstacles because the sea border and location are difficult to identify. The location should be tracked to protect the safety of the fisherman. This technology displays the location using latitude and longitude coordinates and also transmits data via SMS to the coastline guard and fishermen's mobile phone numbers. If the boat gets too close to the restricted zone, an alert message will be delivered. By comparing the previously specified coordinates and the current location coordinates, the limited zone may be computed. The system has been created with GPS (global positioning system) as the basic underpinning concept. This system's primary goal is to track the position of the fisherman. This system can handle both location and security.

The proposed technology aids in determining the boat's voyage path. It is concluded that the system is required to resolve the issue of location tracking. When the boat is closer to the other country's borders, the location should be communicated to both the fisherman and the coastal guard using GPS. GPS can simply track the location by providing co-ordinates of latitude and longitude. Because GPS can be easily attached to any electronic equipment, this system can be quickly deployed, and because GPS location tracking is dependent on the signal, this disadvantage can be solved.

PROPOSED SYSTEM

In our daily lives, we hear stories of many fishermen being apprehended, detained, and even killed by navy. One of the major reasons for transnational atrocities is the inability to easily identify maritime borders between nations. Here, we have developed a system that protects fishermen by demarcating land boundaries with the global positioning system. global positioning system for mobile communications gsm Using a GPS receiver, you can determine your current latitude and longitude and communicate them to your microcontroller. The control unit then compares the current latitude and longitude values with predefined values to determine your current location.. From the results of the comparison, the system recognizes that the fisherman is trying to reach the boundary of the sea. The area is divided into 4 zones: the normal zone, the warning zone, the zone near the no-go zone, and finally the no-go zone. Blynk can be accessed from your mobile or laptop and is also available as a cloud.

III.RESULTS AND DISCUSSIONS

The following figures determine the results for each module. The figure1.2 represents the latitude and longitude coordinates to the fishermen by the GPS receiver and processed by Node MCU. The figure1.3 represents the alert message with location through SMS to all mobile phones connected. The figure1.1 represents the location of the boat while travelling in sea

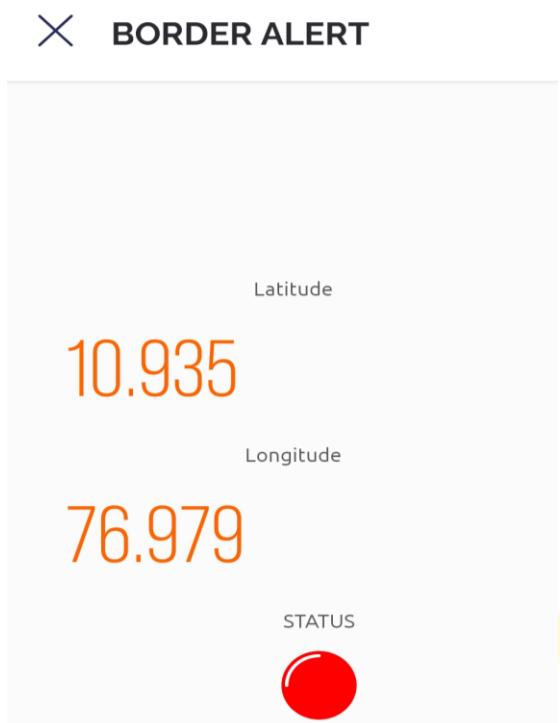


Figure 1.1. Blynk app Alert button interface output (outside the border)

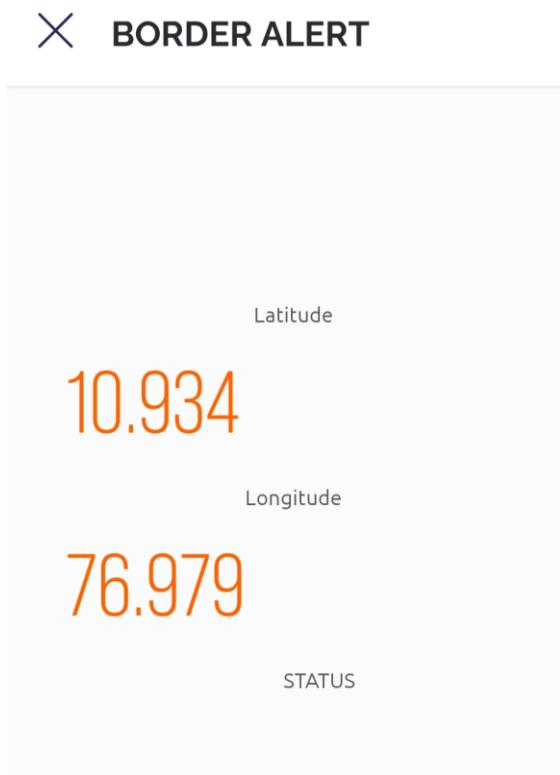


Figure1.2 Blynk app interface output (inside the border)

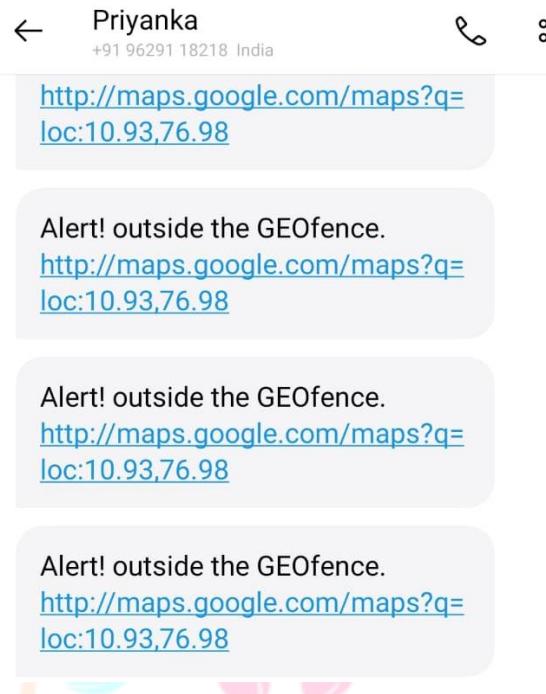


Figure 1.3 GSM Alert message output

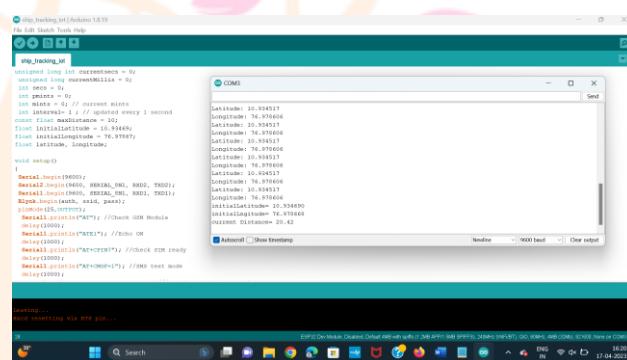


Fig 1.7 AUDINO IDE OUTPUT

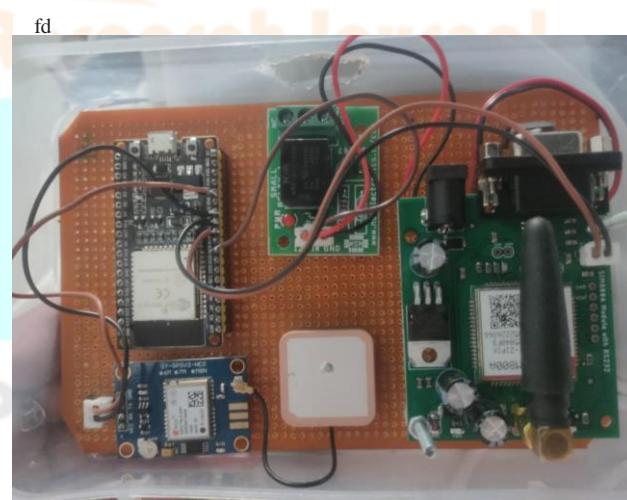


Fig. 2 FMB SHIP TRACKING IOT DEVICE

IV. FUTURE SCOPE

Fisherman Border Ship Tracking Using IoT with Cloud Application has a bright future. Here are some possible areas for growth:

Integration with Artificial Intelligence: Integrating AI with Fisherman Border Ship Tracking utilizing IoT with Cloud Application can increase the system's accuracy and

efficiency. Large volumes of data from IoT sensors may be analyzed using machine learning algorithms to find trends and abnormalities in vessel behavior.

maritime environment and the lives of lawful fishermen as technology advances.

Automation and Autonomy: In the future, Fisherman Border Ship Tracking utilizing IoT with Cloud Application may incorporate autonomous capabilities. Unmanned surface boats (USVs) and unmanned aerial vehicles (UAVs) outfitted with IoT sensors might be used to monitor and detect illicit fishing operations.

work with international partners to detect and prevent illegal fishing on a global scale using blockchain technology and fishermen a fisherman border ship tracking iot with cloud application might be constructed to encourage sustainable fishing practices and preserve the maritime ecosystem border ship tracking with iot and cloud applications will increase openness and traceability in the seafood supply chain perhaps contributing in the reduction of illegal fishing

overall fisherman border ship tracking utilizing iot with cloud application has a lot of space for expansion and improvement in the future as technology develops this system will become increasingly significant in supporting sustainable fishing practices and maintaining the marine environment as technology advances

V.CONCLUSION

This allows fishermen to easily identify borders, thus preventing fishermen from entering the area. In this way, they save lives and ensure good relations with neighboring countries. Vessel piracy can also be easily controlled

Finally, Fisher Man Border Ship Tracking Using IoT with Cloud Application is a novel solution that solves the issues connected with illicit fishing along maritime boundaries. With rising seafood demand and the need to safeguard the marine ecosystem, this technology offers a real-time monitoring and tracking system that encourages sustainable fishing practices, inhibits illicit actions, and protects endangered marine species. The integration of IoT sensors and cloud-based apps allows for the efficient and effective monitoring and management of fishing vessel activities in real time. This technology is an important tool for authorities in ensuring the safety and security of maritime boundaries, as well as promoting responsible fishing practices. Fisher Man Border Ship Tracking using IoT with Cloud Application will play an increasingly important role in the preservation of the

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