

## Embedded systems for Geo-fencing and Rescue System for Fisherman (Fisherman Protection System)

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### Abstract:

*On a daily basis, we read of numerous Tamil fisherman being captured, jailed, and killed in Sri Lanka. The fundamental reason for this cross-border tragedy is because the countries' marine borders are difficult to detect. Then we had the idea of developing an embedded device that protects fishermen by delivering a signal to the country's borders via the Global Positioning System (GPS) and the Global System for Mobile Communication (GSM). A GPS receiver is used to identify the location of the fisherman's boat. Using GPS, we can determine the current latitude and longitude data and send them to the microcontroller. To identify the precise position, the controller unit compares the current latitude and longitudinal data to the specified value. As a consequence of the device's manufacture, the fishermen were warned that they were approaching the maritime time barrier. The four regions that make up the area are regular region, alert region, region near to restricted region, and restricted region. The LCD will display the usual area while the vessel is in the normal field. When the boat approaches the restricted region too closely, a warning will sound, and the vessel's fuel injection will be decreased by 50% instantly, reducing the boat's speed to 50% automatically. The boat motor is turned off as it enters the restricted area due to the no of supply of energy to the engine.*

### I. INTRODUCTION

Daily incidents of fishermen from state Tamil Nadu getting caught and killed in the Sri Lankan's sea boundary have enraged all citizen of the state. Around 18,000 boats of various types operate along the India-Sri Lanka maritime border from Tamil Nadu. The Sri Lankan Navy force arrests or kills Tamil Nadu fishermen. GPS (Global Positioning System) is frequently being used for a wide range of applications. Its gives stable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, anytime day and night, anywhere on or near the Earth. The main motive of this paper is to help the fishermen not to navigate beyond other country's border. If a fisherman navigates beyond the country's border, an alarm is generated indicating that the fisherman has crossing the border. With this alarm, the fisherman can be caution and come back to our country's border. A message transmitter is also connected to the gadget, allowing it to send a message to a base station on the beach signalling that a fishing vessel has crossed the boundary. As a result, beach guards can assist and offer further assistance to those fishermen if necessary, preventing them from being murdered or detained.

### II. LITERATURE SURVEY

Alert System for Fishermen Crossing Border using Android by J Charles Finny Joseph, R Dinesh Kumar, M Shubin Aldo provide information about The application can be widely used by people in the border to found the correct path to reach the destination. The application will giving the information of where the devices are being located and intimate them about the issues that occur due to opponent forces in ships to server. This may be used as an incident management tool to prevent disputes in a variety of circumstances. This information was published in International Conference on Electrical, Electronics, and Optimization Techniques - 2016

Location Based Services using Android by Archana Gupta, Mohammed Abdul Qadeer, Sandeep Kumar provide information about From the available GIS processing tools in Android we can realize all three types of Location Based services as a mobile can be configured as a server and for that we can also use the SQLite database to store information as android also supports this technology. We can design the two mobiles to provide peer-peer Location based services through SMS or MMS with the use of accurate intents. It was published in 2009 IEEE

Tagciti: A Practical Approach for Location-Aware and Socially-Relevant Information Creation and Discovery for Mobile Users by Pulathisi Bandara, Udana Bandara shows Tagciti is a novel location-aware and socially- relevant information creating and discovering service for mobile users. Rather on depending on business created location related information, Tagciti provides users the essential means to become part of the information creation process. It facilitates the formation of dynamic, up to date, and socially-relevant shared information. Also, it provides a strong mechanism to socially-relevant and location-aware manner utilizing users' social network and location information and was published in 2008 IEEE.

### III. METHODOLOGY

This paper is proposing a gps module for detecting fisher man and save there life. Basically this project based on zones - Normal zone, warning zone, zone near restricted zone, and restricted zone are the four zones that make up the region. The LCD will indicate normal zone if the boat is in a normal region. If the boat approaches the restricted zone, the alarm will sound, and the speed of the boat engine will be reduced by 50% automatically. When the boat enters the restricted zone, the fuel supply to the engine is cut off, and the boat engine shuts down.

#### A.Block Diagram

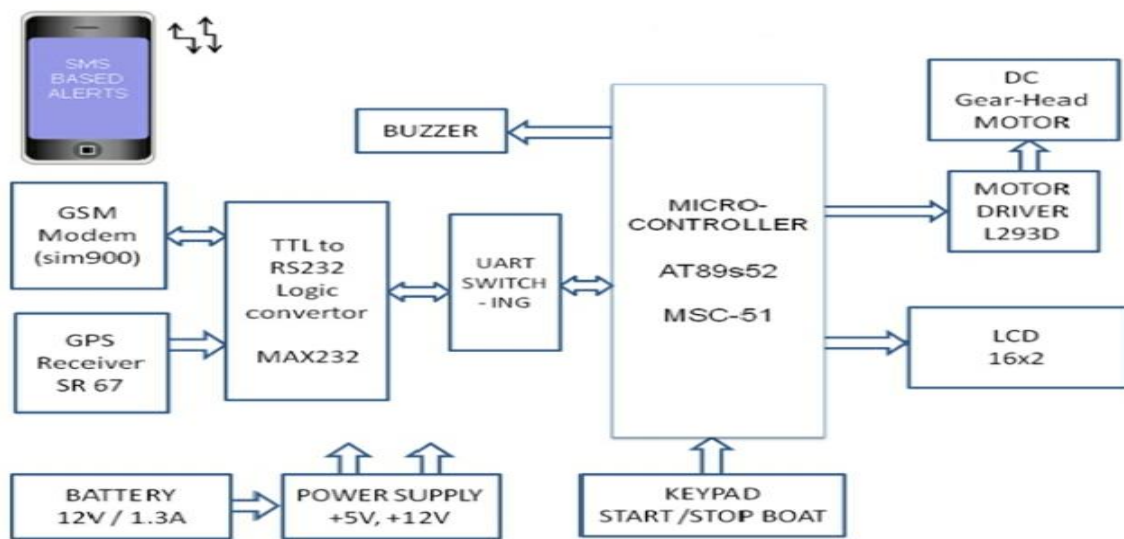


Figure 1 : System block diagram

The gps modem will continually transmit a signal that determines the latitude and longitude of the fisherman and indicates their whereabouts to them. After that, it produces an output that is read and shown on the LCD. The same data is sent to the fisherman's cell phone and sent to the maritime border security at the same time. An eeprom is used to store the data, received by gps receiver. LCD display, gsm modem, and gps receiver are examples of devices that interface with the microcontroller. The global positioning system (GPS) is rapidly being employed for a variety of purposes. It delivers continuous location, navigation, and timing services to users all over the world in all weather conditions, at all hours of the day and night, wherever on or near the planet. The latitude and longitudinal degree of the boat's position are established by comparing the arrival time of the satellite signal with the onboard clock time at when the signal was produced. The current design is an embedded application, which will continuously monitor a moving boat and once the boat goes beyond the level of the defined layer the particular operation will be done. For doing so an ATMEGA328p microcontroller is interfaced serially to a gsm modem and gps receiver.

#### B. GSM : (global system for mobile communication)

A GSM modem is a device which can be used as a mobile to make communicate as a network. GSM modems need a SIM card which is connected to a network. It can be connected to a computer by serial port, Bluetooth or USB connection. The SIM card mounted GSM modem sends SMS to phone by getting the data from Arduino controller through serial communication. The received data is sent to the concerned mobile devices checks the condition that implemented in the microcontroller program. The phone numbers are feed in program already and its functions.

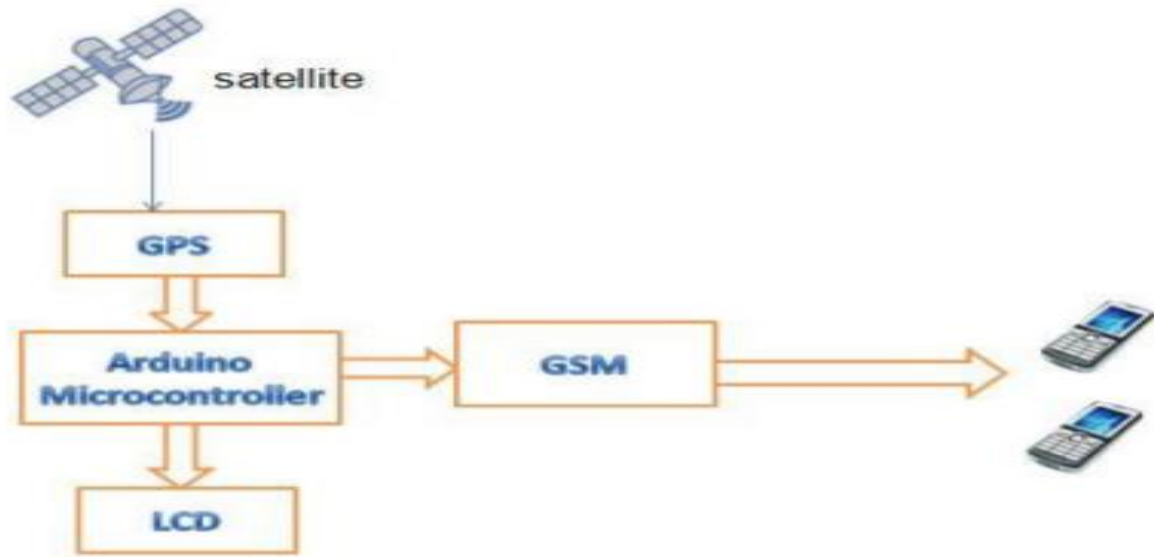


Fig 2 : Block diagram of GSM

### C. GPS (global positioning system)

Cell phones with GPS receivers communicate from the 30 global positioning satellites in the GPS system. GPS uses a formula based on the junction point of overlapping spheres given by satellites and your phone's GPS receiver to establish your position. In other words, trilateration creates overlapping "spheres" that intersect in a circle using the distance between the satellites and the receiver. The present location on the planet is the junction.

### D. LCD Display

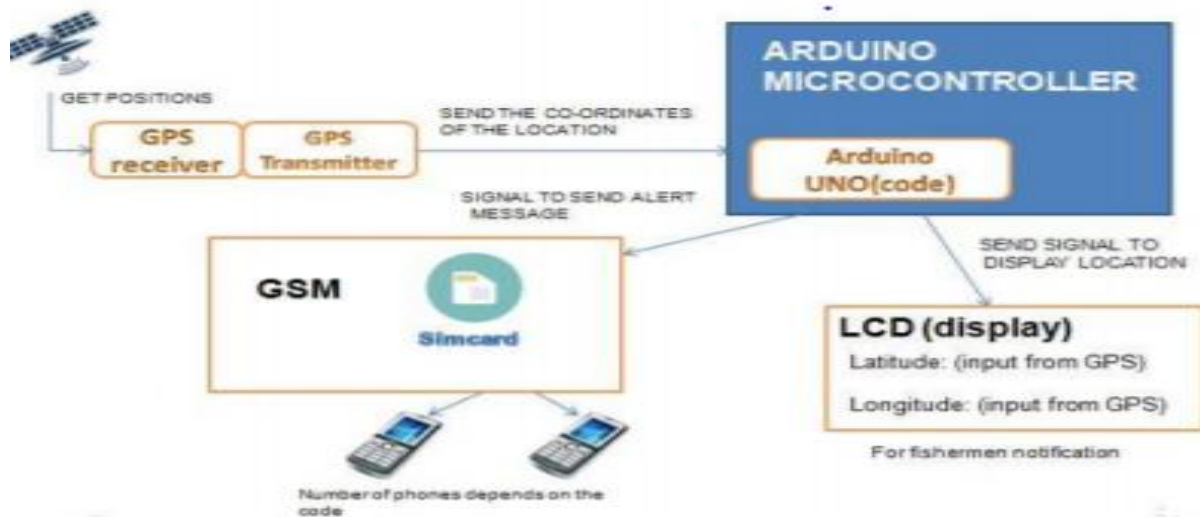
Liquid Crystal Display (LCD) contains materials which composites the properties of crystals and liquid. Since, LCD's are lightweight and has low power consumption, they are compatible with low power electronic circuits, and can be powered for long durations. Because LCDs produce light, light is required to read the display. Reading in the dark is feasible with the help of backlighting. The LCDs have a long life span and can operate in a broad variety of temperatures. LCDs are more consumer friendly since changing the display size or layout size is reasonably straightforward.

### E. Arduino microcontroller and IDE Software

The tracking system with GPS and GSM is controlled by the Arduino UNO in Atmega328 microcontroller. An embedded program is compiled, and then saved into the microcontroller's flash memory. Arduino IDE software is used for editing and compiling the program into the microcontroller. The Arduino IDE software is used to write the application that receives data from the satellite and sends it to the mobile phone. The below coordinates are already implemented in the

program so that alert message can be sent to phones. A Google map is used to display the location of a boat on a cell phone in real time. The Google Maps server is automatically accessed, and the location and place on the map are shown.

#### F. FUNCTIONAL ARCHITECTURE



#### H. Performance Evaluation:

In order to gauge the achievement of the algorithm the subsequent diagnostic categories were considered on the detection stage: true negative (TN), false positive (FP), true positive (TP), false negative (FN). The obtained values for these indexes are contrasted with the segments indicated within the database as having seizure or no seizure by the neurologists. Then the statistical diagnostic indexes of sensitivity (SEN) and specificity (SPE) were also computed. The performance of proposed seizures detector is obtained. Following diagnostic categories are considered on the detection stage: true negative (TN), false positive (FP), true positive (TP), false negative (FN). The obtained values for these indexes are contrasted with the segments indicated within the database as having seizure or no seizure by the neurologists.

#### IV. RESULT AND DISCUSSION

The simulation of this project has done with the help of PROTEUS simulation tool. Printed circuit board layout now offering automation of both component track routing and, placement getting the design into the computer can often be the most time consuming element of the exercise. The simulation result of the proposed work using PROTEUS is given below.

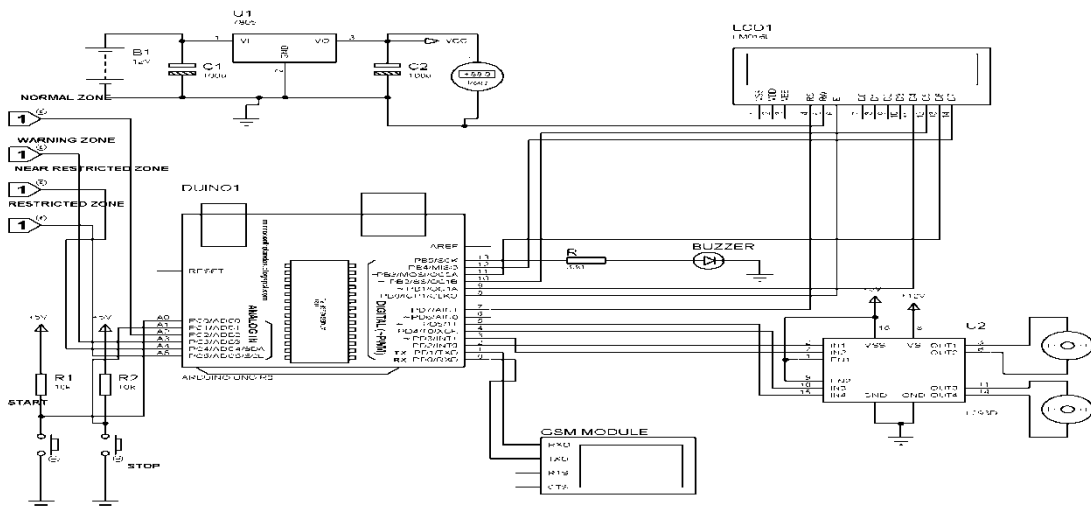


FIG 1 : PROTEUS Simulation tool

Here all the components are configured as per the system design using PROTEUS tool. The fig 1 shows that pin level connection and configuration of all components of three units like control room, boat section and navigation boat. Three level border crossing scenarios are simulated & shown in fig 2, 3, 4. Fig 5 and 6 displays the boat starting and Navigation boat starting simulation setup.

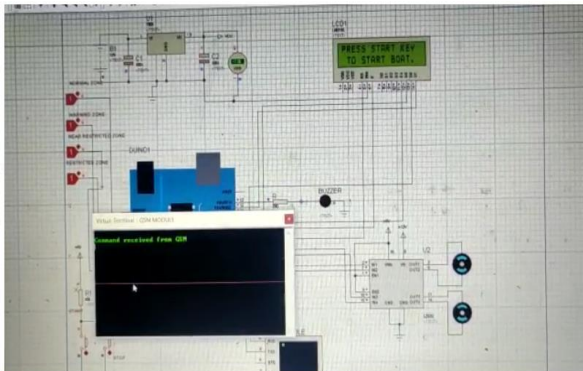


Fig 2. Geofencing system Started Started

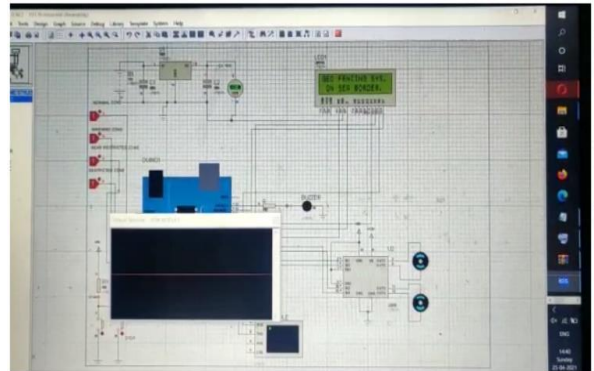


Fig 3. Scanning

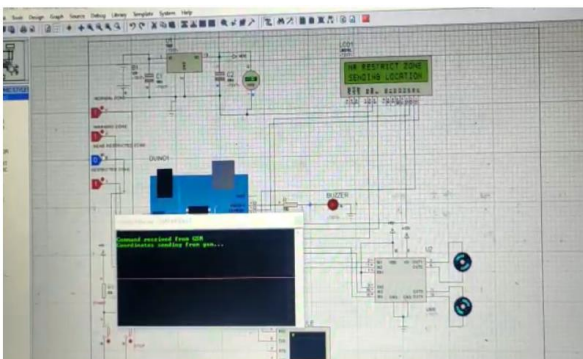


Fig 4. Shows warning zone Shows NR. Restricted Zone

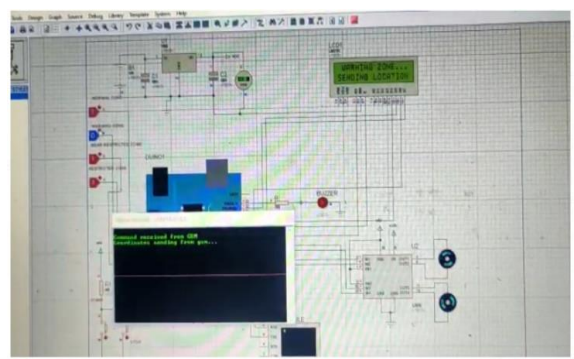


Fig 5.



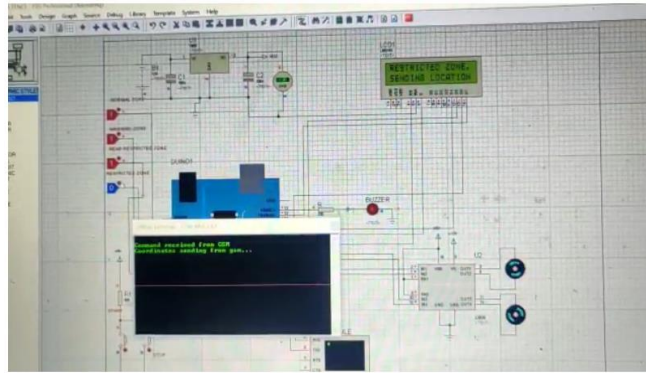


Fig 6. Shows Restricted Zone

## V.CONCLUSION

As a result, fisherman can quickly identify national maritime borders, preventing them from entering their territory. The technology gives highly accurate and precise Latitude and Longitude information. This model outperforms the current approach, which relies solely on a GPS device to track the border and cause the boat to drift backwards. As a result, it not only saves lives but also fosters good ties with neighbouring countries. Piracy aboard ships is something that can be controlled.

## REFERENCES

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