



## **LoRa Based Fisherman Border Alert and Weather Alert Security System**

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### **ABSTRACT—**

Fisherman's Livelihoods often require them to cross country borders, which can unknowingly put them at risk of being captured or Killed and also Many Lives are in the events of an unforeseen storm, cyclones, and other natural Disasters. To address this issues a "LoRa based fisherman Border Alert and Weather Alert Security system" has been developed to help fisherman become aware of Borders Alert and Weather Alert. The system integrates LoRa-enabled sensors and communication devices with advance analytics to enhance the safety and security of fisherman. Here LoRa acts as both Transmitter and Receiver. The existing system is not powerful enough to prevent the crime against fisherman as it gives only the information about the border identification but not about the exact distance that the boat has travelled from the border. The proposed system's transmitter section includes seismic sensor-in order to pick up tsunami, ultrasonic sensor to identifies the Coal reefs, temperature sensor, level sensor and the receiver section includes the LaR

Keywords—LORA, Temperature sensor, Seismic sensor.

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### **I. INTRODUCTION**

More than 14 million people are supported in their Livelihoods and have jobs thanks to fishing. Given that this Industry is crucial to the economy and jobs of all coastal regions. India and Srilanka are divided by their shared maritime borders. Fishing is the main source of income for those who live near the water. Over 25,000 vessels from the Tamil Nadu were entering the Bay of Bengal to fish. There will frequently be conflicts between adjacent nations that share the same oceans. So, those who live close to the sea will face numerous issues. We frequently read in the newspapers and media that many people are dying as a result of these border conflicts. The governments of various nations have split these international seas into various zones, much as they have done with the land to, tackle problems of this nation. Hence, these oceans are surrounded by national borders. Even though there is a border, a lot of people cross it unintentionally and wander into other countries' territories. Fisherman who do this are sometimes imprisoned and subject to harsh punishment, so it is crucial to use modern technology to show fisherman where the border is. The significance of this operation is to prevent fisherman from crossing the border. By pinpointing the precise position, our model's LoRa feature will inform the fisherman when a border is approaching. By initiating the reverse motor process, this type also aids in preventing border crossing.

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### **II. LITERATURE SURVEY**

1. Complete design of an electronic system that tracks the location coordinates of a fisherman's boat. If it seems to cross the national border, an alert message will be sent to the boat. Zigbee is used for wireless communication. Zigbee receiver module is used to receive transmitted SOS messages from nearby boats and it is made sound in the MP3 module.
2. RSSI is used in separation estimate among the transmitter and receiver i.e., used to identify the area between shore and the boat. LCD is used for displaying the output when alarm sound found. Ultrasonic sensor, vibration sensor, single switch, relay and DC motor are used. These sensors are connected to the microcontroller (Arduino). This system lacks complete security and the alert message is not sent to the centralized data hub.
3. GPS will track the latitude and longitude of the current position with the help of satellite signal. The gas, temperature and humidity sensor are used to detect the climatic changes when they are in the ocean and intimate them prior to disasters. This is simple and effective but the Zigbee transmitter covers over a range of 10-100 meters. This system lacks the Engine control unit and also Zigbee transmitter has a limited range of coverage.

4. RADAR operates by recording and processing signal strength information at multiple base stations positioned to provide overlapping coverage in the area of interest. It combines empirical measurements with signal propagation modeling to determine user location and thereby enable location aware services and applications.

### III EXISTING SYSTEM

In this Existing System using GPS technology to track and identify the current position of the boats/ships is presented. These systems used electronic map that provides an effective method for navigation and localization detection by the users. This also acquires increased levels of safety and efficiency for mariners. The accurate position information becomes even more critical in GPS because of some natural disaster.

#### DISADVANTAGES

- GPS has a positional error of between 5m & 10m globally.
- The GPS signal is unable to pass through solid structures so is unable to work indoors, underground, under the water, or under a dense canopy of trees. Can be affected by large buildings and is typically unreliable in Central Business District areas.
- GPS accuracy is related to the quality of signal reception, the larger the antenna the better the signal – so absolute miniaturization is not possible whilst maintaining good positioning accuracy.
- Turn-by-turn directions are not available on every type of GPS device.

### IV. PROPOSED SYSTEM

The proposed methodology uses LORA technology it is used to measure the exact distance between the boat and the border. It uses the same technology to send the message to the fisherman that there is a border ahead. Next it uses voice alert to send voice note to the fisherman. If the boat continues to go ahead in spite of the alerts given then this system will help to turn off the engine by converting the electrical energy to mechanical energy to save the fisherman from crossing the border. The key components used in this system are AT89S52 Microcontroller, LORA, Vibration sensor, Ultrasonic sensor, Relay and motor.

#### ADVANTAGES

- Provide Continuous position values.
- Power Consumption is Low.
- Low Budget and improves security.
- Rescue.

#### BLOCK DIAGRAM

##### BOAT SECTION:

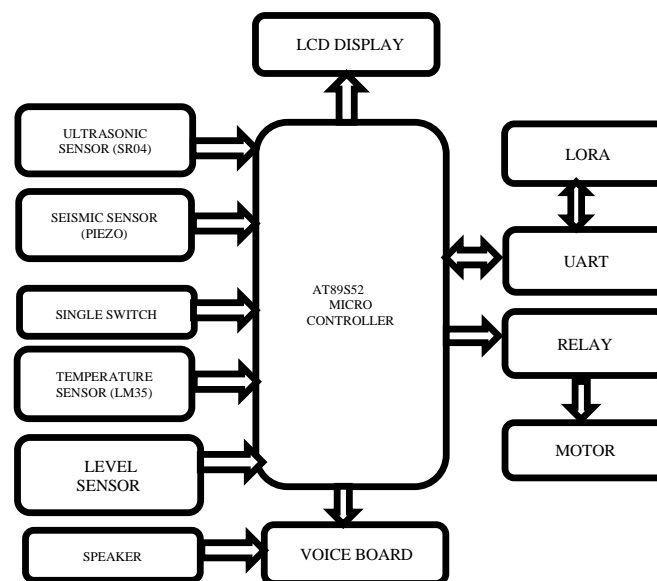


Fig 1. Block diagram of Boat Section

Control Section



Fig 2. Block diagram of Receiver Side.

#### DESCRIPTION

##### AT89S52 MICROCONTROLLER:

It is a lower power, high performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high density non-volatile memory technology and is compatible with the Industry-standard 80C51 instruction set and pin out.

##### ULTRASONIC SENSOR:

It generate high frequency sound waves and evaluate the echo which is received back by the sensor. SR04 creates sounds we can't hear, which help us to figure out, how far things are placed. Sensor can feel things within a specific area.

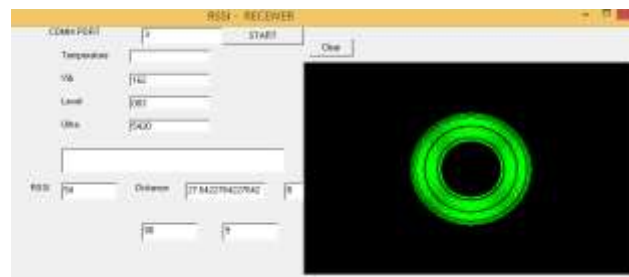
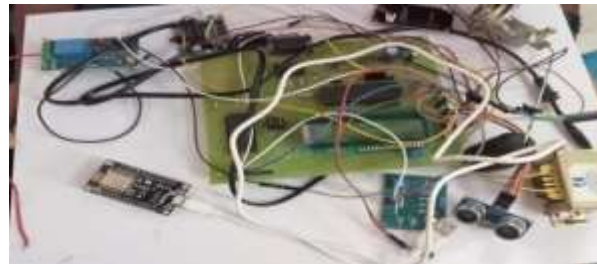
##### SEISMIC SENSOR:

PIEZO sensor used to identifies the movement of ground when it is shaken by some type disturbance. And also used to convert mechanical stress into electrical charge, it gives AC at output.

##### LORA

LORA act as transceiver, in case of disaster we can also communicate from the base station to every boat if the seismic sensor in the boat reached its threshold, Ultrasonic sensor to detect coral reefs which helps to prevent the fisherman.

## V. RESULTS AND DISCUSSION



Thus an efficient internal ship communication is carried out using LoRa technology. All the parameters within the ship are monitored and transmitted using LoRa module without delay. All these data are received in control room of the port. It gives an exact distance that the boat has travelled from the border and it provides greater possibility to know about their location incase of any danger. Added advantage of LoRa technology is that they can be used even underwater where no other means of communication would be possible and reliable.

## VI. CONCLUSION AND FUTURE SCOPE

The nautical border alarm system suggested in this study is a novel approach to increasing marine border security. An independent monitoring system based on Lora is used by the system to track and report any suspicious behaviour in the defined region, and a reverse motor mechanism prevents unlawful entry. Extensive testing has proven the system's dependability and efficacy, proving that it can quickly and precisely identify possible threats. Furthermore, the system is a great option for marine border protection due to its user-friendly interface and simple installation. Overall, this project presents a potential strategy to improve maritime border security, and it is anticipated to make a substantial contribution to the efforts to safeguard maritime borders around the world.

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