Boat Localisation And Warning System for Border   Identification

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ABSTRACT : *This paper comes up with the boat localisation based on the RSSI(Received signal   strength indication) technology .This paper focuses on the boat localisation that is finding the location of the boat irrespective of the climatic conditions and border identification that is guiding the boat about the border and making the boat not to cross the border by turning off the engine .The proposed system comprise of Arduino MEGA, RSSI zigbee, DC motor and the monitoring will be done by the PC in the control room This system gives three kind of alerts to the fisherman in the boat .The first alert will be given in the form of message .The second alert is if the distance between the fisherman and the border does not decrease despite of the alert message then the APR voice will alert the person that there is a border at a certain distance ahead .The third alert will be in the form of action that is the boat engine will be turned off so that he cannot cross the border.*

Keywords-Arduino MEGA, RSSI Zigbee, APR voice alert, GSM.

1. INTRODUCTION

Fishing provides livelihood support and employment to more than 14 million people and also contribute to agricultural exports. As this is an important sector for all the coastal lands in terms of economy and employment. The countries like Srilanka and India are separated by their marine borders. People who are living near the ocean mainly depends on fishing to survive their life. Especially in tamilnadu nearly 25,000 boats were running into the Bay of Bengal for fishing. The neighbouring countries sharing the same oceans will often engage in disputes. so there will be many problems for people who are living near the sea. Frequently we hear in the newspapers and media many peoples are losing their lives because of these fights between the borders. In order to solve these kind of problems the governments of countries have divided these international waters into different regions same as that of the land. So these oceans have borders that belong to different countries. Even if there is a border many of them are unknowingly crossing the border and stray into the other countries border. If the fisherman stray those borders they get jailed and severely punished and even killed some times. As this cruelty is not descending it is very important to indicate fisherman about the borders using the current technology. So here comes the importance of this project to save fisherman from crossing the border. Our model will be using RSSI (Received signal strength indication) which will alert the fisherman that there is a border ahead by determining the location exactly. This model also helps to switch the engine off when he does not react to the alert.

2. RELATED WORKS

In the paper [1] a track bot is used to sense the moving object within 5m distance. It is used to find the relative position and speed of the moving object. A technology used to find the location by using multi-lateration with landmarks and a probabilistic RFID map-based technique [6][8]. In [9] distance based and angle-based algorithms are used to find the location in underwater. It uses a practical case where the sensor

nodes are not important. It provides the evaluation of the radio frequency technology and its feasible implements.

3. EXISTING MODEL

The current system uses GPS to know longitude and latitude values which helps to detect the location of the boat. This system is not that effective as it needs a data base for finding the longitude and latitude values. This data base requires large amount of data to be stored which will increase its price. Even by using this data base the location cannot be determined exactly in this existing project and due to this the exact distance between the fisherman and the border cannot be calculated accurately and it just gives the approximate location of the boat and cannot find the exact distance between the boat and the border .It will not show the correct time when the boat reaches the border.
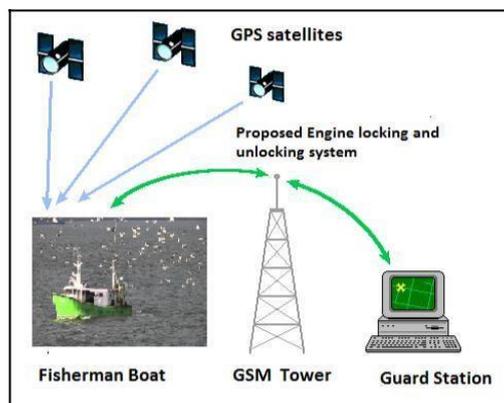

Fig 1   Using GPS existing model

4. PROPOSED MODEL

The proposed system uses RSSI Zigbee technology it is used to measure the exact distance between the boat and   the border. It uses the GSM to send the message to the fisherman that there is a border ahead. Next it uses APR (Audio record and playback) voice alert to send a 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 the mechanical energy to save the fisherman from crossing the border. The key components used in this system are Arduino MEGA, RSSI Zigbee, APR voice alert, GSM.

TRANSMITTER SECTION
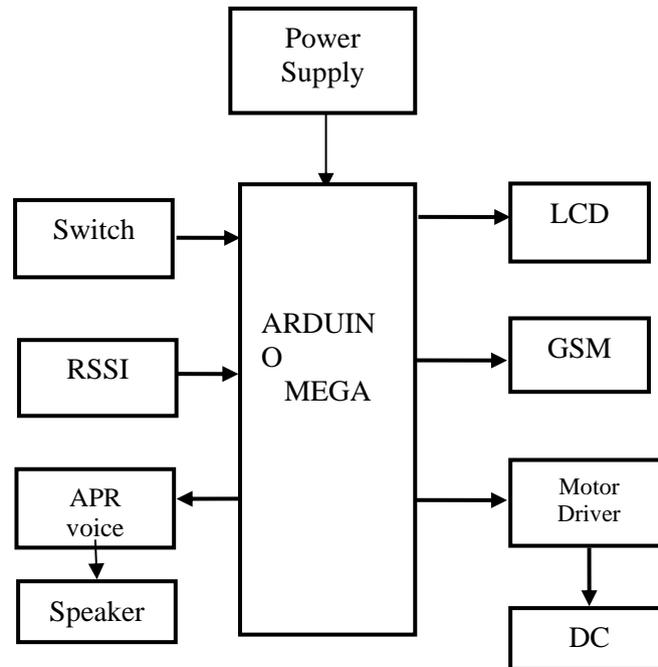
Fig 2 Block Diagram of transmitter section

RECEIVER SECTION
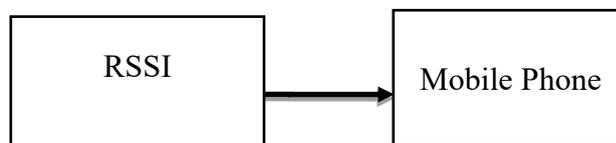
Fig 3 Block diagram of Receiver section

When the boat starts the RSSI (Received signal strength indication) will help to find the location by calculating the strength of the signal received.

The areas near to the border will be considered as the red zones. The LCD will help displaying the zone name to the fisherman in the boat.

The message will be sent through GSM to the fisherman.

If the boat reaches the border then the signal will be sent to the motor driver using ARDUINO MEGA and the motor driver uses DC motor to turn off the boat.

The DC motor will turn off the boat by converting the electrical energy to the mechanical energy.

The APR voice alert and the speaker is used to alert   the fisherman that he is crossing the border.

In the APR voice alert the message is already recorded and it just playbacks when the border is nearby. This voice alert can also work without power supply.

In a case that the fisherman cannot operate the boat that is in an emergency situation the switch can be pressed by the fisherman which will send the message to the control room and they can send the rescue team and the team can save them using the location of the boat.

RSSI

Fig 4 Diagram of RSSI

RSSI is received signal strength indication. Here NODEMCU ESP 8266 is used.

It can hear a signal of a boat from router or access point.

It can be used internally in the wireless network card. When the certain threshold value is greater than the amount of radio energy in the channel, the network card is clear to send.

APR VOICE
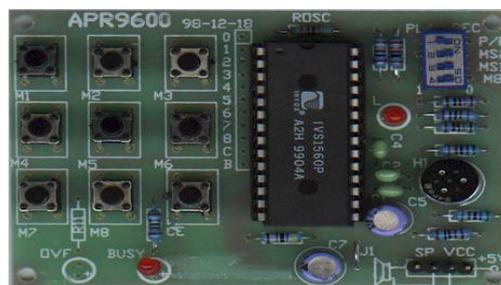
Fig 5 Diagram of APR VOICE

APR 9600 is a sound record/replay IC.

Recorded sound is retained even after the power supply is removed from the module.
The replayed sound exhibits high quality level.

MOTOR DRIVER
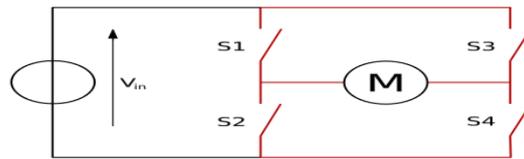
Fig 6 Diagram of H-Bridge Circuit

When the motor is directly connected to the output then it might cause some damage to the circuit.

To overcome the damage motor circuit is used which can acts as a bridge between motor and the circuit.

Here H-Bridge Circuit as a motor driver is used.

DC MOTOR
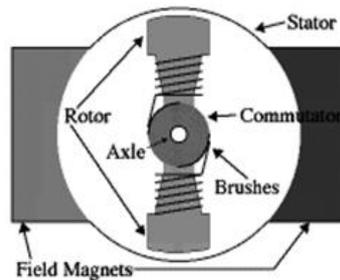
Fig 7 Diagram of DC motor

DC motor is an electric motor that runs on an electric power. It depends on electromagnetism.

The carrying conductor placed in a magnetic field experiences a force which causes it to rotate with respect to its original position.

It uses Fleming's Lefthand rule

$$F = BIL \text{ newtons}$$

5. RESULT
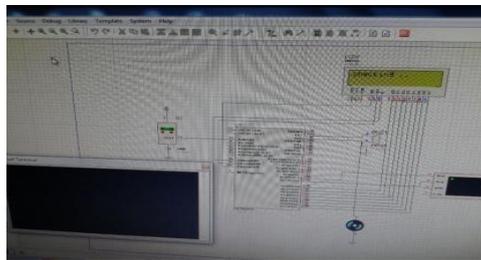
Fig 8 Checking whether the boat is crossing its border
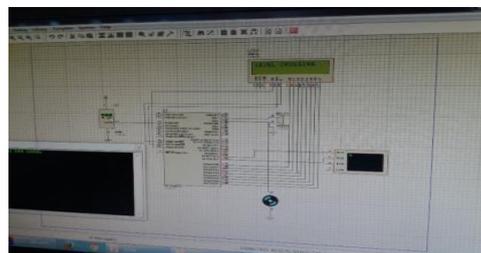
Fig 9 LCD displays the alert when boat is nearing the border.
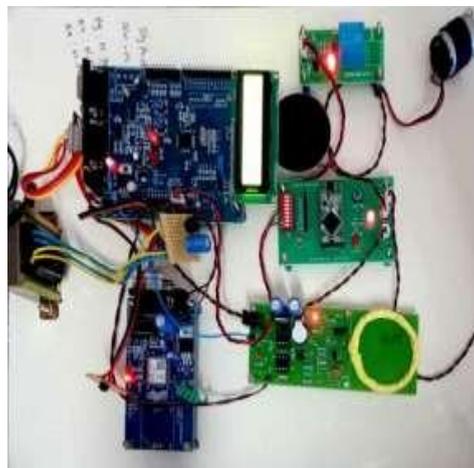
Fig 10 Picture of Hardware.

The result of this model is when the boat is nearing the border it will alert the fishermen by sending the message. Here the figure 8 shows that checking whether the boat is crossing the border. Figure 9 shows that the alert is shown when the boat is nearing the border. Even after sending the message the boat is either not turning the direction or stopping the boat the boat will gets turned off automatically. The advantages are fast response, easy to use, rescuing fisherman's life, improved security. The disadvantage is if there is any clone or floods in the ocean/sea, cannot able to inform the fisherman by prior.so it is not able to rescue the fisherman life in that situation.

6. CONCLUSION

RSSI is used to find the location of the boat and this will help the fisherman to be aware of the border and so this project can save the fisherman from high payments and imprisonment .The proposed system is that it is of low cost it does not require a large data base to store the longitude and the latitude values it can find the accurate location of the boat and can calculate the exact distance between the boat and the border and it is a wireless communication . This system can be implemented in the future by installing it in the boats and sending alerts to the control room by the satellite communication. This alert will be received by the control room and they can send the rescue team in an emergency situation.

7. FUTURE SCOPE

✓ All fishermen cannot afford the money to buy these systems.
✓ In future it can be given to government at a reasonable price.
✓ So that the government will give this system to the fishermen at free of cost.

8. REFERENCES

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