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Survey on Location Tracker for Fishermen using GPS

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ABSTRACT

There are many risks that can occur for fishermen as sea border and location cannot be easily identifiable. To ensure the safety of the fishermen, the location should be tracked. It is also better when the border crossing intimation is also given to the fisherman and coastal guards for tracking even if any problem happens to fishermen the data sent to coastal guards can take the necessary actions can take. The better indication is when the boat nearer to the restricted zone the location information should be sent to fishermen. The system should contain the better accuracy in determination of location, easily replaceable and the maintenance cost should be low.

Keywords: *GPS, GSM, Arduino (At-mega).*

1. INTRODUCTION

In Tamil Nadu about many thousands of boats conduct fishing along the India-Sri Lanka sea border. They get shot by the Lankan navy by accidentally crossing the border without knowledge. This leads to loss in the both humans as well as their economic incomes. A system which eliminates such problems and saves the lives of the fishermen should be developed. The primary reason for these mishaps is due to the absence of a physical boundary and lack of navigational tools for small fishermen, so the border will be detected and an alert message will be sent to mobile phones or else only the location information is sent. A system should be developed which is fast and accurate as it even determines the location in degrees which the boat is heading so the problem lies in the monitoring of the boats is overcome.

2. GPS, GSM AND GPRS BASED SYSTEMS

Abubakar Shameez et al. (2016) [1], proposes the system based on Global Positioning System (GPS), Global system for mobile communication (GSM), LCD displays are used to track the location. There are divided into 4 zones, if it reaches the final zone (i.e.) near to border the engine will get off. The fishermen can easily identify the national sea borders using this system, but the problem is once the boat reaches border and the LCD light will display. The result of this system may vary in different boats.

Arunvijay. D et al. (2014) [2], projected already the system where GPS and GSM are used to track the location of the fishermen and the crossing country border is indicated. The location of the fishing boat or vessel will be tracked using GPS. The current latitude and longitude values will be obtained and it is sent to the microcontroller unit. If the boat enters the zone nearer to the restricted zone the alarm will turn on and the speed of the boat engine automatically gets decreased by 50%. If the fisherman did not take any reaction about the alarm and move further, then the boat will enter into the restricted zone, the alarm continues to ring as before, and once it

reaches the restricted zone, the boat engine gets off by the control of fuel supply to engine. It may cause cost problem or mechanical issue in fuel tank and to manufacturer while designing.

Jaganath K et al. (2017) [6] used another method. The location tracker is designed using GPS, GSM, buzzers. If the boat crosses the location, an alarm is indicated by buzzer. The fisherman can able to identify the international border and they can be prevented from capturing of other coastal border unit. The alarm indicates when the boat crosses the border, and The VMSS (Vehicle Monitoring and Security System) is a vehicle tracking system which uses GPS for security applications. Due to the complex design
and other maintenance cost is not reached its expected success. Another system developed by Jayasundere. N D et al. (2015) [7] represents a localization system, which is able to track the localization and speed of the subject of interest that is equipped with GPS and GSM devices. The owner can get the current location of the vehicle at any time. Lock/unlock the current GPS coordinates of the vehicle to detect unauthorized movement and lock/unlock the maximum speed of the vehicle to get an alert if the vehicle goes beyond that speed. Here, it is not meant for fishermen its only suits for literal business ships.

Yi-Hsuan Yeh et al. (2013) [10] proposed another method of tracking the location by using GPS, dynamic threshold and SMS. It is used widely but implementation of Android makes the system need internet to track even though the location alone informed using SMS. Border detection is impossible using this system.

3. THE LOCATION TRACKING USING ARDUINO

Micheal Drieberg et al. (2013) [9] developed a vehicle tracking system's hardware prototype has also been presented using Arduino micro controller. The result is not so accurate for far distances in sea.

P Dhivyabharathi et al. (2013) [4] also projected using Arduino. The border detection and alert system is more improved using android phones the main problem is the usage of internet. Although the system improved more in GUI and other facilities the reality is no fisherman takes android mobile phones to sea. The result is obtained as expected but the problem is illiteracy of fisherman in using android phones.

4. ZIGBEE TECHNOLOGY BASED SYSTEMS

Friedrich Samuel et al. (2016) [5] designed a system contains ZigBee transmitter/ receiver which plays the main role as it serves as the connection point between the boat and the control room. ZigBee protocol for transmission of data to the control room and the GPS helps to find the location co ordinates and also the weather conditions to fishermen. The major issue here is replacement with Zigbee complaint appliances can be costly and no more secure than a typical 802.11 wireless network. It uses lithium battery. The accuracy of this system is about 70% of expected result because of the cost it is not used wide.

5. ALERT SYSTEM USING ANDROID

J Charles Finny Joseph et al. (2016) [3] used android application which proposes the location of the ship to the border security forces. The automatic alarming system is going to be provided along with this device which alerts in case any sort of issues. This is devised in such a way that the application can be easily been utilized by all the people in the surroundings. The major issue is it will indicate only when it crosses the border so only 40% result is achieved.

6. LOCALIZATION USING LOW POWER RSSI

Kishore Kumar Reddy. N. G et al. (2016) [8] divided the sea area three zones namely. Safe, Intermediate and danger zones. The boat is allowed anywhere within the safety zone. If the boat reaches the intermediate zone, a buzzer alarm will ring. If the boat reaches the danger zone, intimation is given to the fisherman where he is supposed to reach the intermediate zone within the required time, else the engine gets stopped automatically and the control of the boat goes to the control room the boat will be released only after inspection by the coast guard or after the emergency help is given. The different Ranges are identified using Received Signal Strength Indicator (RSSI). It is impracticality in enclosed environments, because it requires an unobstructed line of sight between the device and combination satellites, so it is the main problem in this system.

7. RESULTS AND DISCUSSION

Table 1. Discussion on Results

S. No	Paper	Approach	Result	Issues
1.	GPS Based System for Detection and Control of Maritime Boundary Intruding Boats	GPS and ZigBee transmitter/ receiver plays the main role	This system is about 70% of expected result	The transmitter can be failed at any time and the cost is more so not used Wide.
2.	Border Alert System for Fishermen Using GPS System	LCD displays are used to indicate the Border.	It is divided into 4 zones to indicate the border	If the light is not seen then the fisherman doesn't know the border
3.	GPS Based Border Alert System for Fisherman	The VMSS (Vehicle Monitoring and Security System)is Used.	Security of the data transmitted is Achieved .	Due to the complex design and other costs it is not reached the expected Success.
4.	A Tracking System Using Location Prediction and Dynamic Threshold for Minimizing SMS Delivery	Android phone is used but also send via SMS.	Even without internet also the data is sent via SMS	Border detection is impossible using this System
5.	GPS based border alert system using Arduino	Only Android phone is Used.	Better GUI than other systems to indicate the location	Internet access is necessary to activate this system.

6.	Alert System for Fishermen Crossing Border using Android	Android phones with login and registration of individual details.	The border detection and alert system is more improved using android Phones.	Indicate only when the border is crossed.
7.	Development of Vehicle Tracking System using GPS and GSM Modem	Arduino micro controller are used	The development of a vehicle tracking system's hardware prototype has been presented	The result is not so accurate for far distances in Sea .
8.	Design of Border Alert System for Fishermen Using GPS	GPS, GSM and GPRS are used.	Tracking of boat and also the unauthorized travel are Detected and caught	The boat engine gets off by the control of fuel supply to engine so Additional mechanism are involved.
9.	Ensuring Fishermen Safety through Range Based System by Tri-zonal Localization using Low Power RSSI	The different Ranges are identified using Received Signal Strength Indicator (RSSI)	The sea area is divided into three zones to indicate the nearest location to border.	It requires an unobstructed line of sight between the device and combination satellites, so it is the main problem in system.
10.	Offline Tracking System for Deep Sea Going Vessels using GPS.	The GPS and GPRS are the main components for tracking offline.	Better tracking system for vehicle than other system.	It is not meant for fishermen its only suits for business ships.

8. CONCLUSION AND FUTURE WORKS

From the review of various papers, it is concluded that there are more system are proposed to solve the location tracking problem but each contains some issues and problems. The intimation of location should be to both the fisherman and coastal guard when the boat is nearer to the other countries boundaries with location using GPS is better than other solutions. The system proposes only for one boat to track the location. In upcoming years, the system can be extended by tracking multiple boats using single system.

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