International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 03 | Mar-2018 www.irjet.net p-ISSN: 2395-0072

DEVELOPMENT OF FISHERMEN BORDER ALERT AND SPEED REDUCTION SYSTEM USING RFID WITH GSM ALERT

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Abstract - *The design is a border alert system to safeguard the fisherman from being caught by other countries in coastal area. RF communication system Global System for Mobile communication and Wireless Networks can be the best choice for addressing the maritime border crossing issue. In case to prevent further movement it reduces the speed and completely stops the motor of the boats. The information is maintained on the movement and location of the fishermen. As because of the major threatening issue it leads to loss in the both humans as well as their economic incomes. The border system uses the Location of the fishermen to alert when they reach the border or try to cross the border. The system further reduces the speed and completely stops the motor if in case they try to cross the Border. Future avenues of work include implementing the system on a hardware platform and testing it with real life scenarios.*

Keywords—Border System, Global System for Mobile communication, Alert system, Sensor, Transmitter, RF communication system, Microcontroller, Robustness.

I. INTRODUCTION

In the modern era, securing international borders is a complex task and involves international collaboration, deployment of advanced technological solutions and professional skill-sets. The island like Sri Lanka, peninsula like India and the coastal countries are separated by their maritime borders. Crossing the border is being a serious offence. Due to carelessness or unknowing the boundary limit, the fisherman used to rude the maritime borders. Once they rude the border, they arrested or killed by the relevant navy and they are being abducted and their boats are being captured by the neighborhood countries. The technology proliferation will be an apt choice for resolving the nautical boundary crossing issue. RF communication system Global System for Mobile communication (GSM) and Wireless Networks can be the best choice for addressing the maritime border crossing issue. The proposed system is used to devise a low cost alert system for fisherman that gives an alert when the boat/ship crossed beyond other country's border. If the fishermen violate the border agreement, an alarm is generated and the driver reduces the speed and stops the motor through the use of microcontroller and Ethernet shield. Thus guards in the shore can assist and provide additional help to those fishermen if needed. Keeping in mind about lives of Indian fishermen, this device has been created to help them not to move beyond Indian border.

II. RELATED WORKS

[1] A wireless sensor network (WSN) for the surveillance of critical areas and properties is currently developed which incorporates mechanisms to ensure information security. The system is focused on ensuring integrity and authenticity of generated alarms and availability in the presence of an attacker who may even compromise a limited number of sensor nodes. One of the most interesting application scenarios for WSNs is the domain of area surveillance systems. The project FleGSens realizes such a surveillance system for critical areas like e.g. borders or private properties. Its main objectives are the secure detection and signaling of trespassers within a predefined area in the presence of both malicious and non-malicious interference. The system consists of a trespass detection protocol that detects trespassers and signals the detection towards a dedicated gateway, and a node failure detection protocol which informs the gateway if a node fails to respond for a specified period of time. Currently the tested is being extended for further outdoor experiments and to test the protocols in larger real-world scenarios.

[2] Border protection from intrusion has always been difficult and expensive, especially when the terrain is in hospitable. The system proposes a new energy efficient approach to provide early detection of intrusion using Wireless sensor Networks. The systematically deployed sensor nodes not only detect the intrusion but also help to track them. The long and inhospitable terrain conditions of the border make it very difficult to detect the intrusions in all weather conditions. Existing WSNs developed for battle field monitoring consist of dense deployment of complex nodes which could be either static or mobile. Multi-hop mechanisms are used to communicate the sensed alerts to be delivered at Access Points. The proposed system uses sensors which are less complex and hence can be cheaper and can provide better battery life. Most of the hardware proposed can be easily integrated from existing available off the shelf systems used for radars and communication systems.

[3] Surveillance is a critical problem for harbor protection, border control or the security of commercial facilities. The effective protection of vast near-coast sea surfaces and busy harbor areas from intrusions of unauthorized marine vessels, such as pirate's smugglers or illegal fishermen is particularly challenging. Intrusion detection on the sea is a critical surveillance problem for harbor protection, border security, and the protection of commercial facilities, such as oil platforms and fisheries. The traditional methods of detecting ships entail the use of radars or satellites which are very expensive. Besides the high cost, satellite images are easily affected by cloud cover, and it is difficult to detect small boats or ships on the sea with marine radar due to the noise or clutter generated by the uneven sea surface. They exploit the spatial and temporal correlations of the intrusion to increase the detection reliability and conducted evaluations with real data collected by our initial experiments, and provide analysis of the system.

[4] Wireless sensor networks (WSNs) can be used to monitor the interested region using multihop communication. Coverage is a primary metric to evaluate the capacity of monitoring. Connectivity also needs to be guaranteed so that the sink node receives all sensed data for future processing. They proposed allocation-independent, energy-efficient routing algorithm EECCR, which simultaneously preserves the network-coverage ratio and the sensor n-connectivity probability. A WSN is composed of numerous tiny sensor nodes. These nodes have processing and communication capacities, which enable the collection of surrounding information and then the transmission of the report data to a sink node/base station. Coverage is an important metric to measure the quality of service of the network. An improved algorithm should be designed so that the interested region can be evenly m-covered with a desired ratio by the active nodes. Another direction is to schedule the sensor nodes with the different initial energy in an energy- efficient approach**.**

[5] The application can be widely used by people in the border to find the appropriate path to reach the destination. The notification will be sent to the border security forces which act as the server to all other devices that are operated by people in ships. The application will notify 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 can act as an incident management application to avoid conflicts at varying situations.

III. PROPOSED SYSTEM

1. BORDER ALERT SYSTEM USING RFID AND GSM

a. REGISTRATION AND LOGIN

The user will perform either login or registration operation. After these operations get over he will go to the next phase. The module allows the new user to register and open the application to the browser which helps to monitor the actions that are happening in the border that could be traced by the officer and user. The security credentials are maintained so the issues that occur can be easily resolved. The registration can also be done by means of personal id also which is highly useful for illiterate people which can be directly used by the user or officer by just typing their id in that text fields.

b. RECEIVING SIGNAL:

The transmitter and receiver modules are connected with arduino boards. The transmitter is place in the field and the receiver is placed in the system end. The transmitter and receiver is given an id while configuring it. All the transmitters in the field should know the receiver's id which is the destination address. The receiver will receive signal from various transmitters kept in the field. The receiver at the system end is connected to the web server via UART. The UART is used here because of its low cost while interfacing with arduino micro -controller and fast connection establishment. When the data from the transmitter receives the receiver, it sends request to the web server. The SERIAL communication cable is connected to the arduino micro-controller.

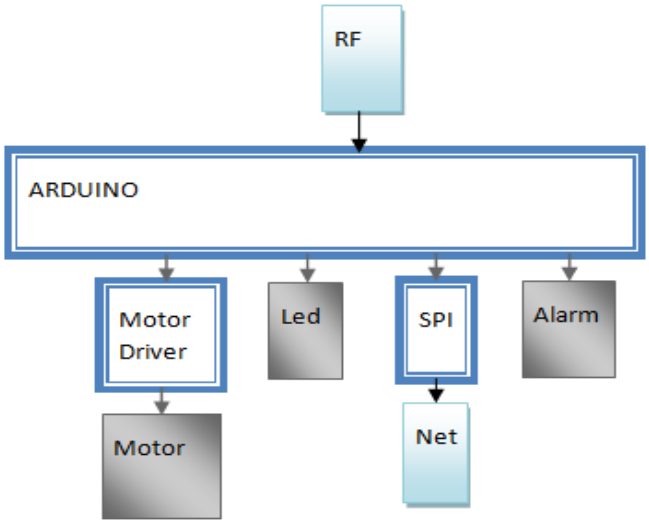
c. CONNECT HARDWARE TO SERVER

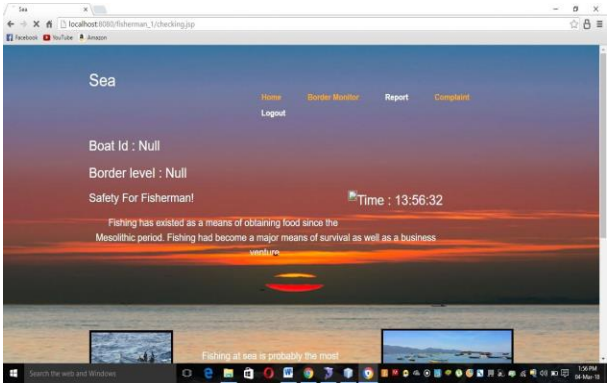
Connecting the hardware components like sensors, power supply, motor and buzzer to the arduino board. Then the connection is started between the arduino to server by clicking the button event, once we start the server all the data will be received by the computer from the arduino.

d. REPORT AND ALERT:

The data processing is the task of checking the various sensors data received from the field with the already fixed threshold values. The threshold values vary according to the fixed value. The motor will be slow or switched off automatically based on the signal level. If the sensor value is detect like abnormal then the sms is send to nearest officer. If the boat reaches the border or it is nearer to the border, an alarm is indicated by buzzer. It will keep on increasing by pulse width modulation.

IV.BLOCK DIAGRAM





V. CONCLUSION

This paper studies the complex and sometimes conflicting requirements for such a WSN system. After determining that detection probability or orthogonal paths is an appropriate metric for measuring the crossing detection quality of the LWSN, we presented a method that calculates the required network density to achieve the specified level of coverage, while maintaining radio connectivity within the network.

VI. FUTURE ENHANCEMENT

Future avenues of work include implementing the system on a hardware platform and testing it with real life scenarios, such as various intrusion models, complex terrains and different sensing modalities. Current scenario is of building 50 WiFi-based BSNs, which are equipped with accelerometer vibration sensors. This hardware platform is designed to accept a broad range of sensor types, which will allow testing the proposed system in other applications such as gas pipeline monitoring.

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