

Safe Range - Danger zone alert System

Nagarajan. V^{*1}, Joseph Jebaraj. C², Rahul U³, V. Gokula Krishnan⁴

^{1,2,3}Computer Science Department, Panimalar Institute of Technology, Poonamallee, Tamil Nadu, India

⁴Professor, Computer Science Department, Panimalar Institute of Technology, Poonamallee, Tamil Nadu, India

ABSTRACT

Fishing is one of the most important professions in any civilization to meet the wishes of the humans. However, the border agreements between countries may additionally reason inconvenience to the angler. An angler whilst concerned in fishing may additionally pass the border limits set through the countries within the water our bodies because of negligence. This assignment is aimed toward solving this trouble by using setting up 3 distinct zones for the fishermen to navigate in which might be namely safe area, Intermediate area, chance area. A sign is beeped to the fisherman as he is going thru distinct zones, finally if the fisherman does pass the hazard region and does not return within a span of time the boat stops and an emergency sign is dispatched to the manipulate room for help.

Keywords: ZigBee, Received Signal Strength Indicator (RSSI), Intermediated Frequency, Wi-Fi, Bluetooth, RFID, Microcosm, FAOSOSD, OS-CFAR, AND-CFAR, OR-CFAR, Harmonic Extraction

I. INTRODUCTION

The primary purpose of generation around us is to make the living of people greater handy. The latest introduction of tracking technology is being positioned into impact in numerous fields to ensure the safety of people the subsequent is one such attempt to ensure the protection of the fishermen community folks that move into the sea their protection within the sea is done by using constantly preserving a music of them and when they go the imaginary zones set a sign is beeped to them thereby even preserving them knowledgeable approximately their whereabouts this is finished by way of the use of unique technologies .The Zigbee is used to transmit the indicators and RSSI is used to indicate the sign strength to discover the place of the boat.

ZigBee is an IEEE 802.15.4-primarily based specification for a collection of excessive-level verbal exchange protocols used to create personal vicinity networks with small, low-energy virtual radios, which includes for domestic automation, clinical tool statistics series, and other low-electricity low-bandwidth wishes, designed for small scale projects which need a wireless

connection. Its low electricity intake limits transmission distances to 10–100 meters line-of-sight, relying on energy output and environmental traits. ZigBee devices can transmit data over long distances by passing facts thru a mesh community of intermediate devices to attain extra remote ones. ZigBee is commonly utilized in low data fee packages that require lengthy battery existence and relaxed networking (ZigBee networks are secured by 128-bit symmetric encryption keys.) ZigBee has a described charge of 250kbit/s, first-rate applicable for intermittent statistics transmissions from a sensor or enters tool. ZigBee is one of the international requirements of conversation protocol formulated by using the tremendous task force below the IEEE 802.15 running institution. The fourth inside the series, WPAN Low fee/ZigBee is the most recent and presents specs for devices, which have low data fees, eat very low electricity and are thus characterized by way of long battery life.

Received signal strength indicator (RSSI) is a measurement of the strength present in a received radio signal. RSSI is generally invisible to a person of a receiving tool. However, because signal strength can

vary greatly and have an effect on capability in wireless networking, IEEE 802.11 devices regularly make the dimension available to users. RSSI is often finished within the intermediate frequency (IF) stage earlier than the IF amplifier. In zero-IF systems, it's far carried out in the baseband sign chain, before the baseband amplifier. The RSSI output is mostly a DC analog degree. It can also be sampled via an internal ADC and the resulting codes available at once or thru peripheral or inner processor bus. In an IEEE 802.11 device, RSSI is the relative obtained sign strength in Wi-Fi surroundings, in arbitrary gadgets. RSSI is a sign of the electricity level being received by way of the get hold of radio after the antenna and possible cable loss. Therefore, the higher the RSSI variety, the stronger the sign. Hence, when an RSSI cost is represented in a terrible shape (e.g. -100), the nearer the price is to zero, the more potent the acquired sign has been. Received sign strength indicator is used on this task to hit upon how a long way the boat is from the shore using the energy of the signal that's obtained.

II. METHODS AND MATERIAL

LITERATURE SURVEY

**[1]. Passenger Ship safety: Containing the risk
- Dracos Vassalos 2006**

The Paper describes the numerous problems which could arise to a marine deliver and a probable answer is proposed named "threat based deliver layout". Within the design various injuries which could arise, one of a kind design situations, results, remedial actions and threat manipulate alternatives are formulated priory to assist in the case of creation of any trouble in the sea. Two principal case eventualities highlighted and given a solution are fireplace breakout scenario and Water Flooding eventualities. The goal of the paper is to set protection zones.

**[2]. An Analysis of the Accuracy of Bluetooth Low Energy for Indoor Positioning Applications
- R. Faragher, R. Harle, University of Cambridge, UK -2015**

The paper speaks about "Bluetooth Low power positioning" This gadget is used to especially figuring out role.it additionally demonstrates alternate of Bluetooth low power sign while there's a spatial

interference. The paper demonstrates how Bluetooth low electricity positioning machine is used in the fingerprint-based totally indoor positioning gadget. Bluetooth low strength position gadget (2.4GHZ) gives a method referred to as beaconing mode in which based totally on the message passed the location may be recognized the usage of RSSI.

**[3]. RFID-Based Indoor Positioning Technology
-Yuntian Brian Bai, Suqin Wu,
Hongren Wu, Kefei Zhang
RMIT University, Australia -2012 Dec**

The paper describes Radio Frequency identification generation which became at the beginning advanced for army cause it provides the evaluation of the radio frequency technology and its feasible destiny implementations of this technology consisting of, RFID Tags with a size of 0.4mm × zero.4mm, RFID Readers, and various fields in which RFID can be utilized in. The paper speaks approximately implementation of Indoor positioning device based totally on RFID. It describes hybrid strategies used to put in force indoor positioning machine the usage of ZigBee wireless technology.

**[4]. Smart Phone Localization System with High Accuracy for Blind Persons
-Joan Bordoy, Fabian Höflinger, Johannes Wendeberg, Nikolas Simon and Leonhard Reindl
-Department of the Microsystems Engineering - IMTEK
-University of Freiburg, Germany -2005**

The paper affords a clever smartphone based totally on localization machine for the blind people. Numerous get right of entry to factors are installation and are linked to the clever smartphone and its function has calculated the usage of triangulation wireless fare system is used to growth the precision era which includes wireless and Bluetooth is used. A set of rules named TODA is proposed and implemented.

**[5]. Building the Internet of things using RFID: The RFID ecosystem experience
-E. Welbourne, L. Battle, G. Cole- May/June 2009**

At the University of Washington, the RFID environment creates a microcosm for the net of things. The authors evolved a collection of net-based, user-

degree equipment and programs designed to empower users by using facilitating their understanding, control, and control of private RFID statistics and privacy settings. They deployed these packages within the RFID atmosphere and conducted a four-week user examine to measure trends in adoption and usage of the tools and programs in addition to qualitative reactions.

[6]. Underwater Vehicle Obstacle Avoidance and Path Planning Using a Multi-Beam Forward Looking Sonar

-Yvan Petillot, Ioseba Tena Ruiz, and David M. Lane, Member, IEEE - 2001

The paper presents a method for segmentation of sonar images, tracking of underwater objects and motion estimations. It is used for path planning and obstacle avoidance of the underwater vehicles to ensure its safety. Path planning is achieved using multi-beam forward-looking sonar sensor the framework proposed demonstrates this process by collecting information and processing them A plan finding algorithm is proposed in the paper which is also implemented successfully.

[7]. Automatic Threshold Selection In Os-Cfar Radar Detection Using Information Theoretic Criteria

**-B. Magaz, A. Belouchrani, and M. Hamadouche
-Electronics Department, Ecole Nationale Polytechnique, Algiers, Algeria
-Department of Physics, University of Boumerdes, Boumerdes, Algeria -2011**

The paper proposes a new manner to correctly detecting unwanted interferences within the reference window, as an instance interference which make a gadget make false alarms using facts theoretic criteria principle. FAOSOSD is the principle proposed through the paper which stands for ahead computerized Order choice ordered information Detector, the effects of the proposed gadget are in comparison with OS-CFAR, the AND-CFAR, and the OR-CFAR detectors.

[8]. Acoustic measurements of bubbles in the wake of ship model in tank

-A. Sutina, A. Benilova, H.-S. Roha and Y.I. Nahc - July 2008

The paper proposes a way to discover or to detect a deliver using the bubbles which became produced

when a deliver is about into movement this is made feasible because of the reality that the bubble can travel 1500m And 10m deep, the bubble density is also used to decide the category of the ship and also the rate at which the ship is currently travelling, it proposes a version that may come across even a single bubble and thereby be useful to discover the whereabouts of the deliver. This version changed into also supported by way of Korean employer of protection.

[9]. Extraction of Small Boat Harmonic Signatures from Passive Sonar

George Lloyd Ogden Lisa M. Zurk Portland State University, M. E. Jones, M. E. Peterson Pacific Northwest National Laboratory -Jan 2011

The paper offers how passive sonar structures may be used to extract acoustic signatures from the small boats it is geared toward automated detection and monitoring of maritime traffic the paper offers a device named Harmonic Extraction and analysis device (heat). Harmonics of the essential frequency are extracted from the item and are set as a man or woman signatures consequently it's miles used to locate different signatures for special kinds of boats. This algorithm is, in addition, claimed to be useful in unique environments.

[10]. ZigBee based Wireless Sensor Network

-Kanchan Kaushal, Jaspinder Kaur - Nov 2016

The paper describes ZigBee era, the traits of the ZigBee technology and the ZigBee alliance, the protocols and the architecture of the ZigBee generation also are mentioned it illustrates two get admission to modes Beacon Enabled and NonBeacon Enabled the ZigBee tool object is used mainly for security, provider discovery and binding. A Zigbee unit encompasses the following Coordinator, Router and quits tool.

III. RESULTS AND DISCUSSION

Implementation

MODULES

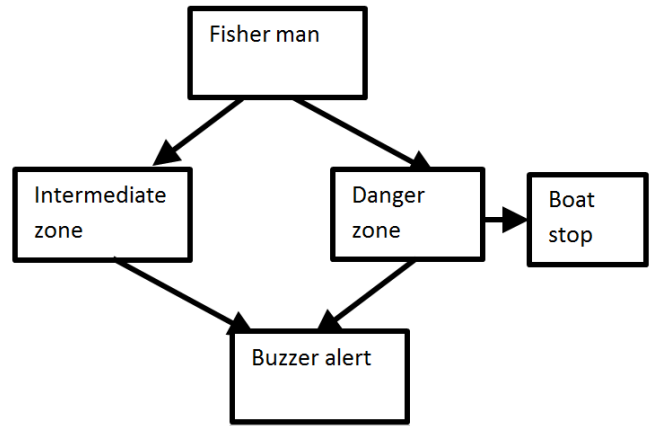
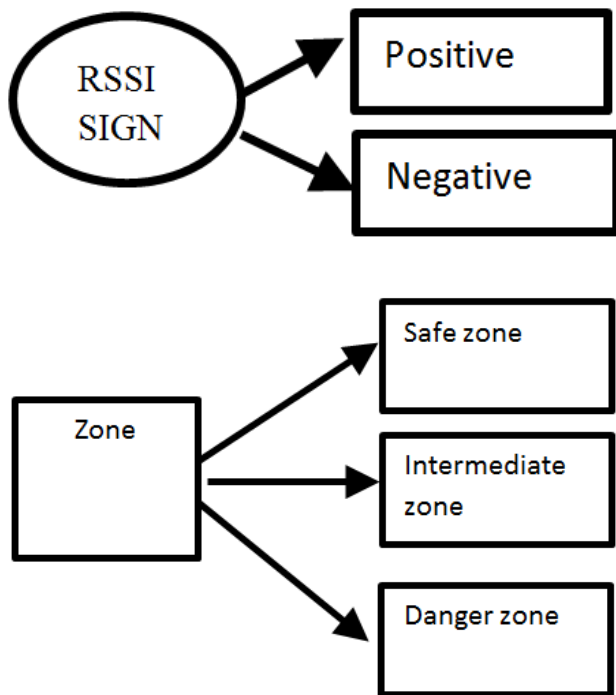
1. RFID based embedded hardware fabrication

RFID stands for Radio Frequency Identification. The antenna picks up signals from an RFID reader or scanner and then returns the signal, usually with some additional data (like a unique serial number or other

customized information). RFID system consists of three components: an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. An RFID reader is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data.

2. Trizonal Implementation

In this module we implement the three zones, which are is safety zone, intermediate zone and danger zone. Ultrasonic sensors are based on measuring the properties of sound waves with frequency above the human audible range. They are based on three physical principles: time of flight, the Doppler Effect, and the attenuation of sound waves. Ultrasonic sensors are non-intrusive in that they do not require physical contact with their target, and can detect certain clear or shiny targets otherwise obscured to some vision based sensors. On the other hand, their measurements are very sensitive to temperature of the target.

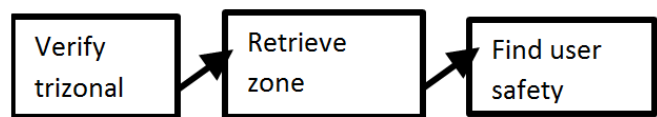


3. Security alert to the fisherman

In this module, a buzzer alert will be given to the fishermen if the boat crosses the intermediate zone and danger zone. If the boat crosses the danger zone, the boat will be stopped and automatically gives buzzer alert. A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows.

4. Server

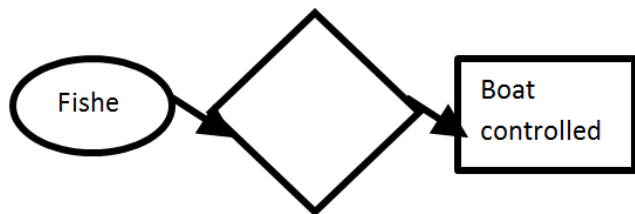
Server is used to verify the trizonal zones like safety zone, intermediate zone and danger zone. Also the Server will analyze the danger zone. So that we the server will extract the Keywords. Also, the Server will be retrieving the zones information like safety zone, intermediate zone and danger zone and find the users safety location.



5. Control System

In this module, If they didn't respond to alert and move their boats back to the safe zone, the boat's control comes under control room of foreign port through ZigBee and fishermen's manual control is disabled. Through ZigBee, the boat shall be operated by control room. Using this control technique, we can enquire if any illegal transportation is carried out. This technique helps fishermen to sail in safe zone without getting into

trouble. In addition to this Ultrasonic sensor is used to help fishermen to find any obstacle on the way. If in case of any problem, the fisherman can also send an emergency message to the control room and so that the coast guard can reach out for them.



Architecture Diagram



IV.CONCLUSION

Sea-surface detection and monitoring with the aid of forwarding searching RSSI is a useful utility for secure AUV and submarine surfacing. On this device, we have proposed an automatic approach for detecting and tracking various sea-floor targets: nevertheless and shifting objects with or without wake and cavitation's noised. it is tough to tune all the boats across the water bodies as of now this gadget is an attempt to make this viable via using the technological improvements the motive is accomplished but the device can, in addition, be upgraded in lots of viable methods to make sure absolute security. The system has an area for improvements; the concept also can be used for different water body vessels now not handiest for fishermen boats.

V. REFERENCES

- [1]. "Passenger Ship safety: Containing the risk" - Dracos Vassalos Marine Technology, Vol. 43, No. 4, October 2006, pp. 203-212.
- [2]. "An Analysis of the Accuracy of Bluetooth Low Energy for Indoor Positioning Applications" R. Faragher, R. Harle, University of Cambridge, Senior Research Associate the University of Cambridge UK -2015
- [3]. "RFID-Based Indoor Positioning Technology" Yuntian Brian Bai, Suqin Wu, Hongren Wu, Kefei Zhang RMIT University, Australia Melbourn Geospatial Sciences RMIT -2012 Dec.
- [4]. "Smart Phone Localization System with High Accuracy for Blind Persons" Joan Bordoy, Fabian Höflinger, Johannes Wendeberg, Nikolas Simon and Leonhard Reindl Department of Microsystems Engineering - IMTEK University of Freiburg, Germany.2015 International Conference on Indoor Positioning and Indoor Navigation (IPIN), 13-16 October 2015, Banff, Alberta, Canada.
- [5]. E. Welbourne et al., "Building the Internet of things using RFID: The RFID ecosystem experience," IEEE Internet Comput., vol. 13, no. 3, pp. 48–55, May/Jun. 2009.
- [6]. "Underwater Vehicle Obstacle Avoidance and Path Planning Using a Multi-Beam Forward Looking Sonar" Yvan Petillot, Ioseba Tena Ruiz, and David M. Lane, Member, IEEE JOURNAL OF OCEANIC ENGINEERING, VOL. 26, NO. 2, APRIL 2001
- [7]. "AUTOMATIC THRESHOLD SELECTION IN OS-CFAR RADAR DETECTION USING INFORMATION THEORETIC CRITERIA" B. Magaz, A. Belouchrani, and M. Hamadouche Electronics Department, Ecole Nationale Polytechnique, Algiers,Algeria Department of Physics, University of Boumerdes, Boumerdes, Algeria - Electromagnetics Research B, Vol. 30, 157–175, 2011.
- [8]. "Acoustic measurements of bubbles in the wake of ship model in tank" A. Sutina, A. Benilova,H.-S. Roha and Y.I. Nahc Acoustics 08 Paris.
- [9]. "Extraction of Small Boat Harmonic Signatures from Passive Sonar George Lloyd Ogden Lisa" M. Zurk Portland State University, M. E. Jones,M. E. Peterson Pacific Northwest National Laboratory - 2011 Acoustical Society of America. [DOI: 10.1121/1.3583500] PACS number(s): 43.60.Hj, 43.60.Lq, 43.30.Wi [EJS].
- [10]. "ZigBee based Wireless Sensor Network" Kanchan Kaushal Et al./(IJCSIT) International Journal Of Computer Science And Information Technologies, Vol.5 (6), 2014,7752-7755.