

The Development of a Visualization Framework Based On Embedded System for Fishing Vessels Using Arduino Board

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Abstract

Fishing is among the foremost dangerous of professions within the planet because once out on the ocean, the fishermen are subject to varied oceanographic and climate. Especially, so within the developing countries of South-East Asia, where fishing could also be an integral neighborhood of the economy, but there aren't any properly established systems for the safety of fishermen. This project aims at providing a possible solution to the numerous hardships faced by the fishermen because they're stopped from any kind of communication. During this project, a transportable device is going to be made, which uses GPS for real-time location detection and uses RF for wireless communication. The device also features a little LCD and a button that acts as a multipurpose signaling switch. Each of the fishing boats is given this portable device. Using the RF transceivers on each of the units, all the boats can form an unplanned network within themselves. Once this unplanned network is established, then the subsequent applications will become possible. 1. Prevention of fishermen from crossing into international areas: Each of the portable units is getting to be programmed with the GPS boundary coordinates for Indian Territory on the sea. With this, whenever a ship comes on the brink of or crosses over into international waters, an alarm is getting to be raised and a message is getting to be transmitted over the network about the cross over. 2. Information about weather conditions: Using the unplanned network, a weather warning is often provided to the fishermen from a coastal station / from coast guard vessels. 3. Distress management: If there's an accident or emergency on a ship, the button is often pressed on the unit, and an automatic SOS message is getting to be broadcasted on the unplanned network, thus enabling rescue operations. 4. Natural Calamity Warning: Once a network like that's in place, it can also be used for applications like Tsunami Warning using sensors that are planted on the ocean bed, and connected to a surface wireless transmitter.

Keywords: Arduino, Seismic Sensor, Wireless Receiving kit, Battery, Buzzer, Bluetooth Module, LCD, Power Supply Unit

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I. INTRODUCTION

Security and disaster alert dissemination showcase the key challenges moon-faced by the fishing business, primarily because of the shortage of reliable communication means that, and will cause serious threats to the lives of the fishermen. The fishing vessels, equipped with acceptable transceivers, are usually thought-about as MANETs (Mobile Ad-hoc Networks) stumped, and communication will happen throughout a hop-by-hop manner. The provision of a visual image framework for such a system allows authorities on the shore to urge info on vessel locations, their transmission ranges, and alternative info, in close to period, and show them. The visual image framework can aid in choosing the foremost favorable routing rule and might facilitate tracing and find the vessels. The system is supposed to modify the users to access it through an online browser and is developed to exploit the most recent internet technologies like HTML5, WebSocket, and Google Maps API V3. The system design, implementation details and so the results obtained are mentioned throughout this paper. The project aims to help the skilled worker to determine our Indian border at intervals the ocean space whereas fishing. By exploiting the eight-bit microcontroller the desired tasks are used to identify the Lankan border. This project facilitates to grasp our border limit of the navy. Then to use this project we'll avoid inessential shooting and inessential death. The fisherman will recognize their limits. The project consists of a transmission base station, Receiver setup. The receiver setup is placed within the boat receives the signal, once the boat is nearing the borderline. Once the receiver receives the signal, a message is transmitted to the coastal guard by means that a warning alarm is given to the skilled worker. By means that of this instant action, the coastal guard will stop the skilled worker from crossing the border. During this project, we tend to are exploitation the wireless technology to send the message from the boat to the workplace with the position of the boat at intervals the ocean exploitation the GPS technology. We tend to are exploitation the pc to store the information of the boat

and also the details of the fishermen and also the main points of the communication the target of the project is to see the particular location of the boat and to show the facet boat once it crosses a marked latitude and great circle. Also, to talk with the coastal guards concerning true of the boat exploitation GPS technology.

II. LITERATURE SURVEY

2.1 EXISTING SYSTEM

The existing system uses HTML 5, Websockets, and Google Maps API V3. The disadvantage of using Websockets is that it keeps the connection open on the server for the duration of the time the user is interacting with the page. This will increase the demand on the server and means you'll always need to scale OUT instead of UP.

2.2 PROPOSED SYSTEM

This project aims at providing an attainable resolution to the various hardships visaged by the fishermen as a result of there is stop from any kind of communication. During this project a conveyable device is going to be created, that uses Wireless Transmission for real-time location detection and uses of wireless communication. The device additionally options a little show LCD digital display alphanumeric display and a button that acts as a utile communication switch. Every of the fishing boats is given this transportable device. Victimization of the wireless transceivers on every one of the units, all the boats will type a network inside themselves. Once this network is established, then the subsequent applications can become attainable.

- i. Prevention of fishermen from crossing into international areas.
- ii. Information about weather conditions: Using the network, a seismic warning can be provided to the fishermen from a costal station / from coast guard vessels.
- iii. Distress management: If there is any accident or emergency situation on a boat, will be broadcasted on the AD Hoc network, thus enabling rescue operations.
- iv. Natural Calamity Warning: Once a network like that is in place, it can also be used for applications like Tsunami Warning using sensors that are planted on the ocean bed, and connected to a surface wireless transmitter.

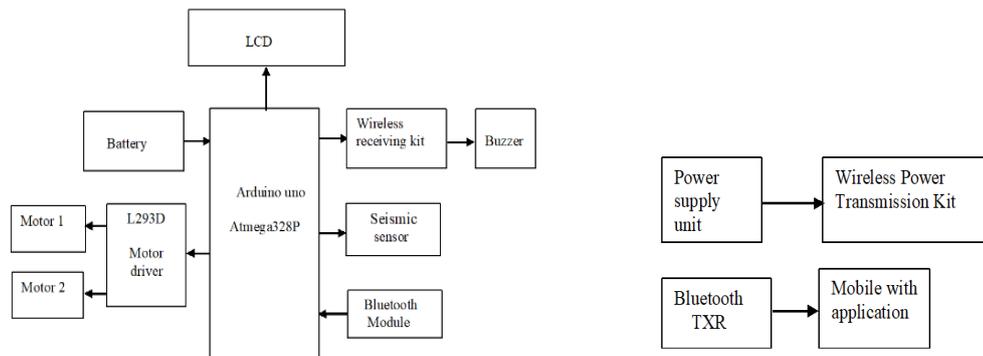


Figure1: Block Diagram of Fisherman device module

2.3 Working

The Arduino uno will control all the device interface with them. The Arduino Bluetooth control application will control the L293D n driver board attached with the motor. When we press the up button in the application the boat will move forward direction down ward button will help to move the boat in reverse direction. Same vice versa right and left will works. Wireless power transmission kit will produce the method of electromagnetic signal helps to knows the border, while the boat will cross the border, buzzer was producing the sound to alert the person. If any vibration will occur in the sea seismic sensor will alerts the person via LCD display.

2.3.1 Arduino

Arduino is AN ASCII text file hardware and code company, project, and user community that styles and manufactures microcontroller-based kits for building digital devices and interactive objects which may sense and management objects inside the physical world. The project is based on microcontroller board styles, factory-made by many vendors, victimization varied microcontrollers. These systems give sets of digital and analog I/O pins which is able to be interfaced to varied growth boards ("shields") and different circuits. The first Arduino was introduced in 2005, about to give an inexpensive and simple approach for novices and professionals to form devices that move with their surroundings victimization sensors and actuators.

2.3.2 Bluetooth

Bluetooth might even be a wireless technology normally used for exchanging knowledge between fastened and mobile devices over short distances victimization radio frequency radio waves among the belief bands, from 2.402 gigahertz to two.480 GHz, and building personal space networks (PANs). It had been originally formed as a wireless different to RS-23. The key options of Bluetooth technology are hardiness, low power, and low price, and so the indisputable fact that it's become a universal normal for exchanging knowledge amongst an expansion of fastened and mobile devices. To boot, Bluetooth wireless technology has the ability to at the same time handle each knowledge and voice transmissions.

2.3.3 Seismic Sensor

The device is also a tool, module, or scheme whose purpose is to find events or changes in its surroundings and send the information to alternative physical science, oft a pc processor. A device is usually used with alternative physical science. Sensors are utilized in everyday objects like touch-sensitive elevator buttons (tactile sensor) and lamps that dim or brighten by touching rock bottom, besides innumerable applications of which most people are never aware.

2.3.4 LCD Display

A liquid-crystal display (LCD) could even be a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly. They use an equivalent basic technology, except that arbitrary images are made from an outsized number of small pixels, while other displays have larger elements. LCDs are utilized during a good range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in portable consumer devices like digital cameras, and mobile telephones, including smartphones.

2.3.5 Wireless Power Transmission/Receiving Kit

Wireless power transfer (WPT) is a very wireless power mechanism, a transmitter device, driven by power from associate influence sources generates a time- variable attraction filed, that transmits power across the house to a receiver device, that extracts power from the earth Associate in Nursing provides it to associate electrical load. The technology of wireless power transmission can eliminate the utilization of the wires and batteries, thus increasing the standard, convenience, Associate in Nursing safety of the associate device for all users.

2.3.6 Power Supply Unit

A power supply unit (PSU) converts mains AC to low-tension regulated DC power for the inside elements of a laptop. Trendy personal computers universally use switched-mode power provides. Some power provides have a manual switch for selecting input voltage, whereas others mechanically adapt to the mains voltage. Among the necessary power provide characteristics is potency over its given temperature vary. Also, there are unit necessary options that defend the ability to provide and its load from harm, like output over current, over temperature, inrush current, and output overvoltage.

2.3.7 L293D Driven Board

The Motor Driver may be a module for motors that permits you to regulate the working speed and direction of two motors simultaneously. This Motor Driver is meant and of developed supported L293D IC. L293D is a 16 Pin Motor Driver IC. This is designed to supply bidirectional drive currents at voltages from 5 V to 36 V.

2.3.8 Motor

A DC motor throughout that the electrical current inside the rotor required to produce torsion is obtained by magnetic attraction induction from the magnetic flux of the mechanical device winding. Associate induction motor will so be created while not electrical connections to the rotor. Three-phase squirrel-cage induction motors square measure wide utilized in industrial drives as a result of they are rugged, reliable, and economical. Single-phase induction motors square measure used extensively for smaller masses, like menage appliances like fans.

2.3.9 Buzzer

A buzzer or beeper is an Associate in Nursing audio device, which may be a mechanical, mechanical device, or electricity. Typical uses of buzzers and beepers embrace alarm devices, timers, and confirmation of user input like depression or keystroke. Electricity buzzers, or piezo buzzers, as they are generally referred to as,

were made up by Japanese makers and fitted into a decent array of merchandise throughout the Seventies to Nineteen Eighties.

2.3.10 Battery

An electric battery could also be a tool consisting of one or a lot of chemical science cells with external connections provided to power electrical devices like flashlights, smartphones, and electrical cars. Once an electric battery is supply power, its positive terminal is that the cathode and its negative terminal is that the anode. The terminal marked negative is that the supply of electrons that once connected to associate external circuit can flow associated deliver energy to an external device. Once the electric battery is connected to an associate external circuit, the electrolytes area unit able to move as ions inside, permitting the chemical reactions to be completed at the separate terminals then deliver energy to the external circuits.

2.4 Advantages

1. It is a modern device with certain specific advantages over the other existing systems.
2. Communication is easier when compared to other devices.
3. It has high efficiency.

III. RESULT AND DISCUSSION

On completion, the concept of having the development of a visualization framework for fishing vessels at sea can be seen that idea is very innovative and useful for the Fisherman. The concept of the mentioned idea is to perform fishing vessels as well as to make them useful. So, it becomes a descriptive research work for the small print of the sensible. Risk of fishermen on the borderline because of inadvertently crossed the border could be reduced by this system. So, saving their lives and providing a sensible relationship with the neighboring countries. Also, the piracy of ships is typically simply brought in restraint. It's robust to hunt out the border vary as inland for anyone in the marine region. Once they crossed the border limit, they have to pay a penalty or got inactive by neighbor country navy guards. This project helps the fishermen to guide by navigation and alerting them once reached the border limit. By exploitation emergency switch fishermen are typically navigated back if they have lost their method inside the ocean or are typically sent facilitate if they are in peril.

This concept of vessel pursuit might enlarge to individual's vehicle security, with the wireless power transmitter receiver kit. Foretelling pictures that help the fishermen by providing the information wherever a lot of range of fishes had been locating. Accuracy and a lot of variety of transmission are getting to be achieved in future This project aims at providing a doable resolution to the numerous hardships Janus faced by the fishermen as a result of they are stopped from any kind of communication. Throughout this project a moveable device is getting to be created, that uses Wireless Transmission for real-time location detection and uses of wireless communication. The device conjointly options a little liquid crystal display LCD digital display alphanumeric display and a button that acts as a useful sign switch. Every of the fishing boats is given this transportable device. The exploitation of the wireless transceivers on every one of the units, all the boats will kind network inside themselves. Once this network is established, then the following applications can become doable.

1. Hindrance of fishermen from crossing into international areas: every one of the transportable units is getting to be programmed with the GPS boundary coordinates for Indian Territory on the ocean if GPS is not operating the wireless power transmitter can help whereas border crossing. With this, whenever a ship comes on the brink of or crosses over into international waters, the Associate in Nursing alarm are getting to be raised and a message are getting to be transmitted over the network concerning the cross over.

2. Info concerning weather conditions: exploitation of the network, a seismic warning is typically provided to the fishermen from a station / from coast guard vessels.

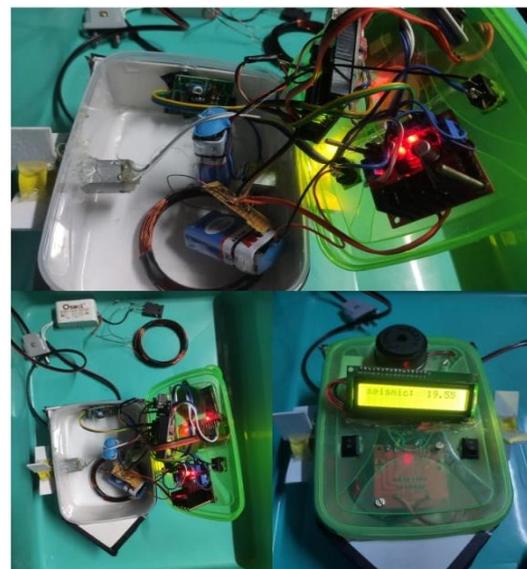
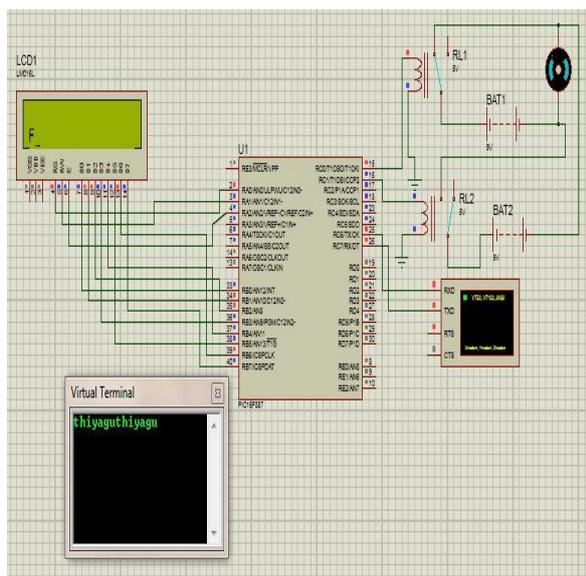
3. Distress management: If there is an accident or emergency state of affairs on a ship, are getting to be broadcasted on the unplanned network, so enabling rescue operations.

4. Natural catastrophe Warning: Once a network like that is in place, it can also be used for applications like wave Warning exploitation sensors. The seismic detector rating is getting to take issue from the vibration that happens inside the ocean or earthquake occur direction rating of vibration happens, so by avoiding the traveling the planet are getting to take issue kind the Sea direction. The detector can work and turn out the continuous reading inside the liquid crystal display LCD digital display alphanumeric display. By exploitation this liquid crystal display LCD digital display alphanumeric display reading the detector are getting to be working once inside the inferior of ocean the vibration level is getting to be inflated by the waves happens inside the ocean.

Sensor	Average Rating	Maximum range	Minimum range
Seismic sensor	17.5	19.6	16.3
Seismic sensor	25.2	29.6	22.3
Seismic sensor	27.1	30.2	25.6
Seismic sensor	30.1	31.6	29.6

In the future following options are typically intercalary to the project and increased. By keeping kits altogether boats and by knowing the locations of all the boats we are going to use our kits to assist the traffic. By exploiting IR sensors, the obstacles which can injury the lowest of the ship are typically avoided. The density of the fishes is typically found by exploiting the sensors. The fishermen are typically power-assisted by creating use of the weather reports.

In this project, fishermen will simply determine the national ocean borders and so preventing them from getting into their space. So, saving their lives and providing a sensible relationship with the neighboring countries. Also, the piracy of ships is typically simply brought in restraint. In the future, EEPROM is typically used to store the previous navigated positions up to 256 locations. Conjointly the scale of the kit is typically reduced by exploitation wireless power transmission. This will increase the accuracy up to 3m.



IV. CONCLUSION

In the beginning stage, we said “The fishing is among the most dangerous of professions in the world” over because once out on the sea, the fishermen are subject to various oceanographic and climatic conditions. So, this project gives a possible solution to the various hardships faced by the fishermen because they are cut off from any form of communication. In this project, a portable device will be made, which uses GPS for real-time location detection and uses Bluetooth for wireless communication. Will gives a proper solution to the fishermen to avoid various difficulties that occur at the border.

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