BORDER ALERT SYSTEM AND CYCLONE EMERGENCY CONTACT FOR FISHERMAN EMERGENCY INDICATION AND SURVEILLANCE SYSTEM

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Abstract— Now a days people living in coastal areas lose their valuable livelihood unknowingly. They are also categorized as militants when they cross the borders. Our project is designed to alleviate such kind of incidents and to alert the fisherman about the border areas .In our project, we are using RSSI technology to alert the fisherman about the distance they are from the border. We also developed a software program using Friis transmission formula to find the distance from the transmitter to receiver for a power P_t and received power P_r. We are setting 12 Km as threshold distance value to alert the boat. Also we use wireless transmission technology to transmit any information from boat to the control room and vice versa. The control room can send an emergency signal to the navy and boat for any help. Also alert information like cyclone, etc , can be sent to boat .

Keywords: RSSI Technology , Fisherman , borders , Wireless Transmission

I.INTRODUCTION

Wireless Integrated Network Sensors (WINS) combine sensing, signal processing, decision capability, and wireless networking capability called Zigbee which is a compact, low power system. On a local, wide-area scale, battlefield situational awareness will provide personnel health monitoring and enhance security and efficiency. Also, on a metropolitan scale, new traffic, security, emergency, and disaster recovery services will be enabled by WINS. Here first it identifies the node where the harmonic signals are produced by the strange objects and the intensity of the signal will be collected .The signal will be sent to the main node. The processing of the regular interval data from the nodes will be analyzed and based on the intensity of the signals and the direction of the detecting nodes gets changing will be observed and the results will be sent to the satellite communication system. The Indian Coastguard was formally inaugurated on 18 August 1978. It is set as an independent armed force of the Indian Union, through an act of parliament. It is the fourth armed force under the Ministry of Defense- the first three being the Army, the Navy and the Air Force. It has a specific character for nonmilitary security but addresses to National Defense. It normally deals with marine safety, maritime security, lifesaving, law enforcement, maritime environmental security and fisheries. These call for monitoring, control, surveillance and response. The Coastguard has multiple responsibilities and strengthening the safety of fisher. The Indian coastguard cannot assist fishers exclusively but concern for fishers is central to its aims. The strategic role of the Coastguard is to protect the maritime zones from illegal activities including infiltration through maritime routes and environmental damage and provide humanitarian and scientific assistance within the maritime domain.

The Indian Coastguard too has its exclusive duties and functions as spelled out in the Coastguard Act 1978 include:

1) Safety and protection of islands and offshore structure.
2) Protection and preservation of maritime environment.
3) Prevention and control of pollution in maritime zone.
4) Assistance to the customs in anti-smuggling operations.

Even though we have this much of coastguard security, all things happening opposite to our thinking. Indian Coastguard has openly admitted its failure in failure in preventing. Mumbai attack even after getting a warning from intelligence sources prior to the attack. This clearly shows that our sea defense is weaker than we believe. The foreign trawler easily overcoming our coastguard security force. Every day we hearing news about fishermen killed or imprisoned when they cross the national sea border inadvertently. The most outstanding problem is being going on for trans-border fishing i.e., on the Indo-Srilankan border. Here two distinct issues are arising. Historically there is no border problem which is being raised and fixed in 1974 and having no conflicts till civil war in 1983.

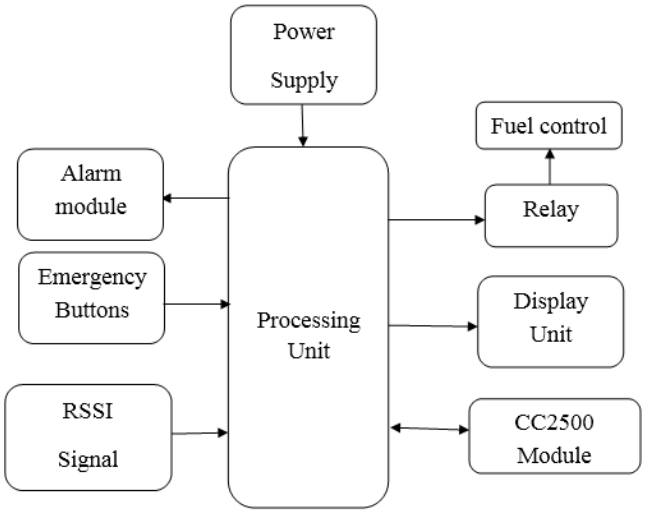
II.LITERATUREREVIEW

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. This is processed mainly for Tamil fishermen's who are employed in the borders. The automatic alarming system is going to be provided along with this device which alerts in case

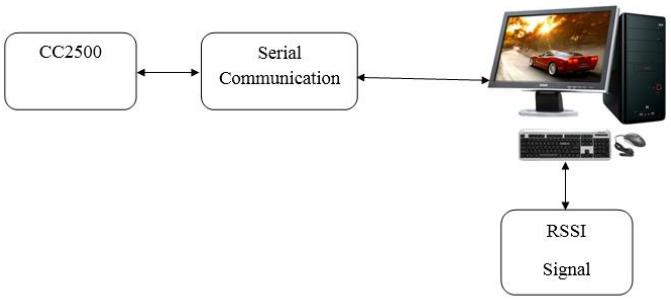
any sort of issues. This is devised in such a way that the application can be easily been utilized by all the people in the surroundings. The application operates based on device tracking. This provides ease to operate even for illiterate people. The results showed that the proposed data-mining framework outperformed the heuristic rules from the knowledge-based expert system model. We conduct evaluations with real data collected in our initial experiments, and provide quantitative analysis of the detection system, such as the successful detection ratio, detection latency, and an estimation of an intruding vessel's velocity.

IIIBLOCK DIAGRAM

BOAT SECTION:



NAVY SECTION:



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IV.SYSTEMDESIGNANDIMPLEMENTATION

4.1.ARDUINO

Arduino ATMEGA-328 microcontroller consist of 14 input and output analog and digital pins (from this 6 pins are considered to be a PWM pins), 6 analog inputs and remaining digital inputs. Power jack cable is used to connect arduino board with the computer. Externally battery is connected with the arduino microcontroller for the power supply. Arduino is an open source microcontroller from which there is no feedback present in the microcontroller. This arduino board consist of I2C bus that can be able to transfer the data from arduino board to the output devices. These arduino boards are programmed over RS232 serial interface connections with ATmegaarduino microcontrollers. The operating volt ranges from 5v. The input voltage recommended for arduino microcontroller is from 7v and the maximum of 12v. The DC input current given to the arduino board is in the range of 40mA.

It consists of different types of memories such as flash memory, EEPROM, SRAM.. The weight of the arduino microcontroller is about 20g. We can use various types of microcontroller such as 8 bit AVL Atmel microcontroller and 32 bit Atmel arm microprocessor. Some of the examples of arduino microcontrollers are Arduino Duemilanove, Arduino UNO, Arduino Leonardo, Arduino Mega, and Arduino MEGA 2560 R3, Arduino MEGA 2560 R3, Arduino Nano, Arduino Due, LilyPadArduino, micro arduino. We have already mentioned, arduino has been programmed by using c and c++ programming language. These c and c++ are high level languages. Normally it has 18 number of input and output pins. Among those 6 pins are considered to be an analog inputs.From these analog inputs, we can be able to work the arduino microcontroller using analog inputs supply.

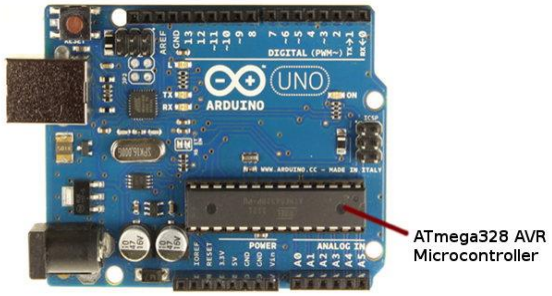

Fig.1:ArduinoUnoBoard

The Arduino Uno has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega8U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '8U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, an *.inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A SoftwareSerial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also support I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus; see the documentation for details. To use the SPI communication, please see the ATmega328 datasheet.

4.2 RSSI TECHNOLOGY

Received Signal Strength Indicator (RSSI) is a measure of the power present in a received radio signal. RSSI is usually invisible to a user of a receiving device. However, because signal strength can vary greatly and affect functionality in, IEEE 802.11 devices often make the measurement available to users. It is a measure of the power level that a RF client device is receiving from an, for example. RSSI is the relative signal strength in a wireless environment and can be measured .

fig 2. RSSI MODULE

It is often expressed in decibels (db), or as percentage values between1-100, and can be either a negative, or a positive value.

4.3 VISUAL BASIC

Visual Basic is a generation event and integrated development environment (IDE) from Microsoft for its COM programming model first released in 1991. Microsoft intended Visual Basic to be relatively easy to learn and use. Visual Basic was derived from BASIC and enables the rapid application development (RAD) of graphical user interface (GUI) applications, access to databases using Data Access Objects, Remote Data Objects, or ActiveX Data Objects, and creation of ActiveX controls and objects.

In 2014 there are hundreds of thousands of developers who still prefer Visual Basic 6.0 over Visual Basic .NET. Moreover, in recent years both mass media and developers lobbied aggressively for a new version of Visual Basic 6.0.

4.3.1 FEATURES OF VISUAL BASIC

Like the BASIC programming language, Visual Basic was designed to accommodate a steep learning curve. Programmers can create both simple and complex GUI applications. Programming in VB is a combination of visually arranging components or controls on a form, specifying attributes and actions for those components, and writing additional lines of code for more functionality.

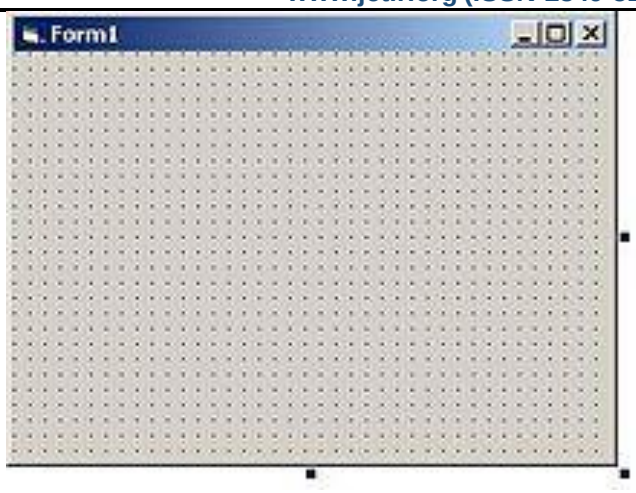

Fig 3 An empty form in Visual Basic 6.

Forms are created using drag-and-drop techniques. A tool is used to place controls (e.g., text boxes, buttons, etc.) on the form (window). Controls have attributes and event handlers associated with them. Default values are provided when the control is created, but may be changed by the programmer.

4.4 EMBEDDED C

Looking around, we find ourselves to be surrounded by various types of embedded systems. Be it a digital camera or a mobile phone or a washing machine, all of them has some kind of processor functioning inside it. Associated with each processor is the embedded software. If hardware forms the body of an embedded system, embedded processor acts as the brain, and embedded software forms its soul. It is the embedded software which primarily governs the functioning of embedded systems. During infancy years of microprocessor based systems, programs were developed using assemblers and fused into the EPROMs. There used to be no mechanism to find what the program was doing. LEDs, switches, etc. were used to check correct execution of the program. Some ‘very fortunate’ developers had In-circuit Simulators (ICEs), but they were too costly and were not quite reliable as well.

Initially C was developed by Kernighan and Ritchie to fit into the space of 8K and to write (portable) operating systems. Originally it was implemented on UNIX operating systems. As it was intended for operating systems development, it can manipulate memory addresses. Also, it allowed programmers to write very compact codes. This has given it the reputation as the language of choice for hackers too.

4.5.OTHERREQUIREMENTS

4.5.1 RELAY

A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of a person moving the switch. It takes a relatively small amount of power to turn on a relay but the relay can control something that draws much more power. Ex: A relay is used to control the air conditioner in your home. The AC unit probably runs off of 220VAC at around 30A. That's 6600 Watts! The coil

that controls the relay may only need a few watts to pull the contacts together.

Fig 4 Relay Basic Section

4.5.2 LIQUID CRYSTAL DISPLAY

LCD(Liquid Crystal Display) screen is an electronic display module and find a wide range of applications . A 16 x 2 LCD display is a very basic module and is very commonly used in various devices and circuits . These modules are preferred over seven segments and other multi segment LEDs . A 16 x 2 LCD means it can display 16 characters per line and there are 2 such lines.In this LCD each character is displayed in 5 x 7 pixel matrix . The LCD has two registers , namely , Command and Data.

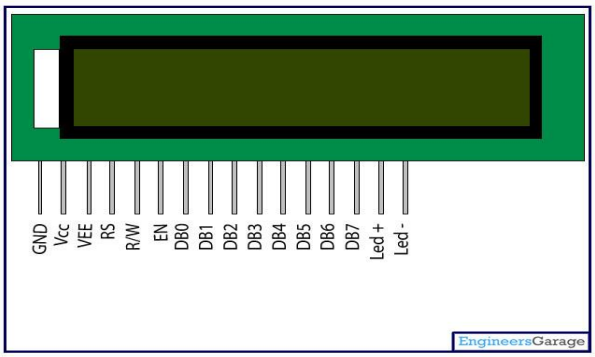

Fig 5 Pin Diagram of LCD

4.5.3ALARM MODULE

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to “plug and play”.

4.5.4 EMERGENCY BUTTONS

There can be any sudden situation of panic. Two emergency buttons were used in the design of the project on considering two cases . It could be either a medical help or fuel low indication . . One button is used for medcal help and the other button is used for medical emergency. Situations can be many for panicking and may vary from person to person.These buttons would be more useful in case of any emergency to the peple in the boat.

4.5.5 C2500 MODULE

It is used to find the dstance between the boat and the border line which combines with RSSI and finds the distance to set the threshold value to alert the fisherman about the border line .The features of C2500 module are:

- High sensitivity (-104 dBm at 2.4 kBaud, 1% packet error rate)
- Low current consumption (13.3 mA in RX, 250 kBaud, input well above sensitivity limit)
- Programmable output power up to +1 dBm
- Excellent receiver selectivity and blocking performance

V.METHODOLOGY

Thefollowingflowchartisusedtoconverttheobtainedimage tolabels.

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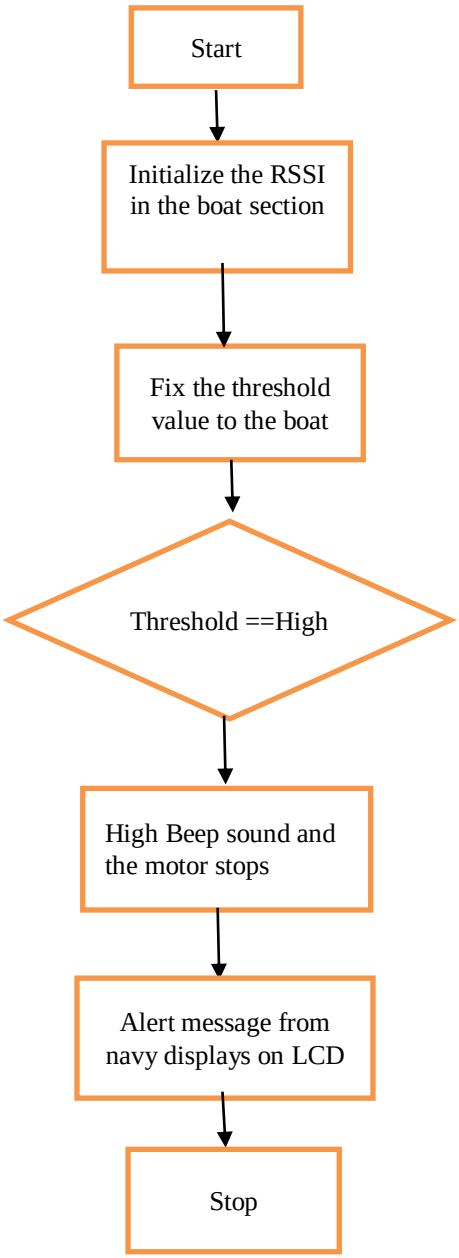
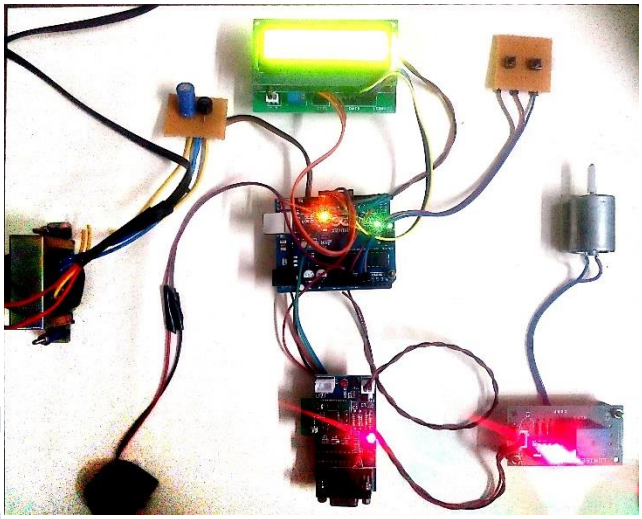
Flow Chart Of the Border Alert System

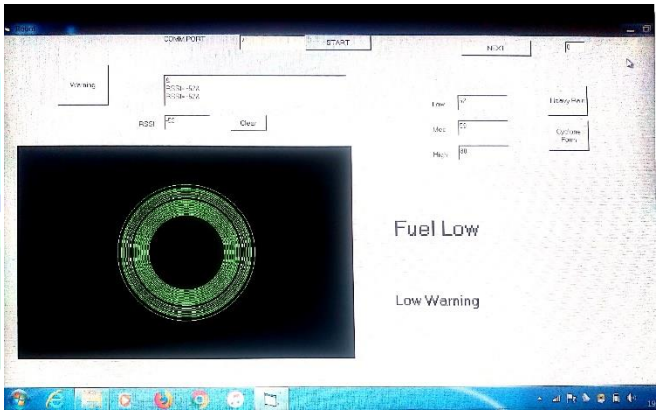


5.3.1 USE OF C IN EMBEDDED SYSTEMS:

- It is small and reasonably simpler to learn, understand, program and debug.
- C Compilers are available for almost all embedded devices in use today, and there is a large pool of experienced C programmers.
- Unlike assembly, C has advantage of processor-independence and is not specific to any particular microprocessor/ microcontroller or any system. This makes it convenient for a user to develop programs that can run on most of the systems.
- As C combines functionality of assembly language and features of high level languages, C is treated as a 'middle-level computer language' or 'high level assembly language'
- It is fairly efficient
- It supports access to I/O and provides ease of management of large embedded projects.

VI.RESULT





VII.CONCLUSION

In the conventional, the fishermen have to keep watch the maritime border, which cannot be easily separated as land region. If they crossed certain limit on the sea. They have to pay the penalty or got arrested by the naval guards of the neighbour country. The project generates alarm if they cross the border by mistake. With the simple circuitry and the use of sensors (low cost sensors) makes the project a low cost product, which can be purchased even by a poor fisherman. This project is best suited for places where the fishermen continuously monitor the boundary limit. This paper will be used for advancement of coastal border averment. This also will give sufficient process to both ship and coastal guardians, if anyone crossing the border. The process of routing the fishermen will make more efficient.

VIII.FUTURESCOPE

The project has considered transmission of the alert signals to boat in the water to control station wirelessly through RSSI Technology. This was done as we do not have accuracy in locating the position .The future scope is that the process on increasing the accuracy will be achieved much more greater in future.

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