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Advanced Shipping Monitoring and Determine Motor Movement using RSSI

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ABSTRACT: The RSSI is regularly assumed to have a linear signal strength by the whole of the logarithm of the communication distance. However, this is not true in certain cases because there are uncertainties in RSSI readings to obstacles, receiver interferences etc. In this complimentary, we specifically ask for the hand of a new RSSI-based communication transcend estimate means based on the upshot of interim data clustering. We alternately handle interruption data, combined with statistical communication of RSSI values, to define the bi-section characteristics of RSSI. We then use interval data jointly clustering and could hear a pin drop clustering to return different levels of RSSI uncertainties, respectively. We have used heartfelt RSSI measurements to consider our communication outstrip estimation in wireless environments. Alternatively our communication has a jump on estimation method effectively which move up in the world promising estimation accuracy with valuable efficiency when compared to contrasting state-of-art approaches. It measure only bandwidth and frequency and cannot consider the network or signal.

KEYWORDS: Embedded system, Memory organisation, Peripherals, Processor, Memory, Received signal strength indicator.

I. INTRODUCTION

An Embedded system is a special purpose computer controlled electro-mechanical system in which the computer is completely encapsulated by the device it controls. This allows an embedded system to be intentionally simplified to lower costs compared to a general- purpose computer accomplishing the same task, by using a CPU that is just “good enough” for these secondary functions. Embedded systems reside in machines that are expected to run continuously for years without errors. Therefore the software is usually developed and tested more carefully than software for Personal computers. Many embedded systems avoid mechanical moving parts such as Disk drives, switches or buttons because these are unreliable compared to solid- state parts such as Flash memory. In addition, the embedded systems may be outside the reach of humans, so the embedded system must be able to restart itself even if catastrophic data corruption has taken place. This is usually accomplished with a standard electronic part called a watchdog timer that resets the computer unless the software periodically resets the timer. the solution based on Global Positioning System (GPS) is not available in indoor environments. Therefore, algorithms in are not based on GPS technique and expensive equipment. signal phase difference between unknown and known (anchor) sensor the RSSI (Received Signal Strength Indicator)-based algorithm is the most popular method with respect to cost, energy and complexity Received Signal Strength Indication (RSSI) is an indicator of the power that the receiver sensors gain as a valid packet RSSI are not very accurate since three factors influence RSSI values: path-loss, fading and shadowing effects. In fact, in real situation with people movement, different obstacles and conditions, we will receive different RSSI values that affect positioning accuracy first we try to understand the characteristics of the RSSI values and then design different experiments in a laboratory situation to gather enough RSSI values’ vectors for further analyses. These experiments encompass different effects such as antenna direction, indoor and outdoor situations, effects of obstacles, sensor positions, time and number of samples, sensors’ distances and people movement. Second, we try to analyze the RSSI values. In the analysis phase, software has been developed to implement RSSI algorithms, analyze our experiments data, and try to position a moving object.

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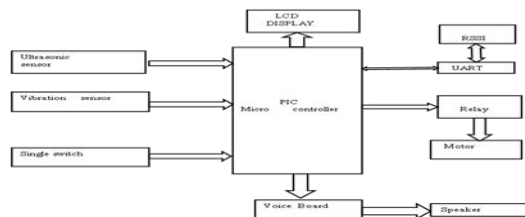
II. EXISTING SYSTEM

In this Existing System using GPS technology to track and identify the current position of the boats/ships is presented. These systems used electronic map that provides an effective method for navigation and localization detection by the users. This also acquires increased levels of safety and efficiency for mariners. The accurate position information becomes even more critical in GPS because of some natural disaster.

III. PROPOSED SYSTEM

In this proposed system, to detect the locations and boundaries of three stages in seashores with the help of RSSI and also intimate to coastal guard was done. Here we configured, the 3 level border B1, B2, and B3 area details are stored in the controlling unit. If a vessel crossed B1, the controlling unit will provide an alert by voice alert via the radio frequency transmitter and vessels will located by coastal guards. If a vessel crossed B2, motor of the boat will be stop. Switch is used to self-start the motor for vessel again came back to B1. The usage of ultrasonic sensor is to detect Ice bar and object tracking.

BLOCK DIAGRAM:
VESSEL SECTION:



3.1 Vibration Sensor

Vibration sensor is used because this takes the accurate reading during the earthquake occurs. It checks the vibration and notes the reading.

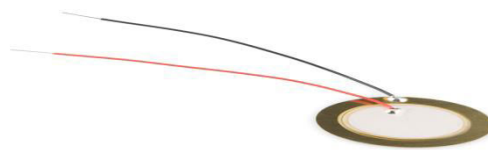


Fig.7. Vibration sensor

3.2. Advantages of proposed system:

- Provide continuous position values.
- Power consumption is low
- Low budget and improves security
- Rescue

3.3. Application:

- Location monitoring for navy and Marian
- Security purpose.

IV. LITERATURE SURVEY

[1]RF transducer, microcontroller unit and LCD display. Zigbee transmitter is connected at the border area. It transmits RF signals within the particular limit. The Zigbee receiver with the micro controller unit is connected at the boat. the

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RF signals are received by the receiver and given to the micro controller unit. The micro controller program is written in embedded c language and the microcontroller used is AT89C51. In zigbee limitations is It is not secure like WIFI based secured system.[2] controller unit finds the current location by comparing the present latitude and longitudinal values with the predefined value. The area is divided into four zones- normal zone, warning zone, zone near to restricted zone and restricted zone. If the boat is in normal area, then the LCD displays normal zone. then reaches the warning zone, the LCD displays warning zone. If the fisherman ignores the warning or fail to see the display and move further, and 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 controlled 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 beep as before, and once it touches the restricted zone, the boat engine gets off by the control of fuel supply to engine. routinely stay into the International Maritime Boundary Line (IMBL) for fishing. From Tamil Nadu about 18,000 boats of different kinds conduct fishing along the India-Sri Lanka maritime border. Limitations is multiple users share the same bandwidth.[3] the wireless technology to send the message from the boat to the office with the position of the boat in the sea using the GPS (Global Positioning System) technology. When the receiver receives the signal, a Message is transmitted to the coastal guard by means of a warning alarm is given to the fisherman.limitations is GPS accuracy depends on sufficient received signal quality.[4] Wireless sensor networks have extensively been utilized over the years for ambient data collection from diverse structural deployments including mesh, ad hoc, and hierarchical layouts.The nodes in a linear topology, constituting a special class of networks called linear sensor networks.limitations is Hence it an unstable network. [5]Aerial networking using directional antennas (ANDA) is referred as a promising solution for the networking of unmanned aerial vehicles (UAVs) and for the fast provision of on-demand communication infrastructure to the ground and decentralised control algorithm.limitations is The main drawback is signal is weak in the some natural disaster.Deafness is the problem of failed to hearing from the others.

Phase1: Processor:

Each design is unique in embedded system.8- bit, 16- bit, and 32- bit processors are available with different processing powers and memory addressing capabilities. a)8- bit Processors: Application involving Minimal Processing and I/O functions such as digital watches, refrigerators, air- conditioners and VCRs use an 8- bit Microcontrollers. b)16-/32-/64- bit Processors: Application involving More Processing and I/O Functions such as Process Control Systems, Telecom Switches, Routers and Protocols Converters use 16-/32- bit Processor with more computing and communication capabilities.

Phase2: Memory:

An Embedded System also needs Memory for two Purposes:

To store its program and

To store its data

Unlike normal desktops, in which programs and data are stored at same place, embedded systems store data and programs in different memories. This is simply because the embedded system doesn't have a hard drive and the program must be stored in memory, even when the power is turned off.

Phase3: Memory organisation:

System space: The Motorola 68k family reserves the first 1024 memory locations for exception vector tables. This system can support upto 256 vectors.

Code space: Above the system space code space stores the instructions.

Data space: Above code space ROM data space stores the constant values such as error messages and string literals.

I/O space: Devices reside in I/O space area.

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Phase4: Peripherals:

Any additional requirement in an embedded system is dependent on the equipment it is controlling. Very often these systems have a Standard Serial Port, Network Interfaces, Input/Output (I/O) interface or hardware to interact with sensors and activators on the Equipment.

V. MODULE DESCRIPTION

5.1. Interfacing sensor:

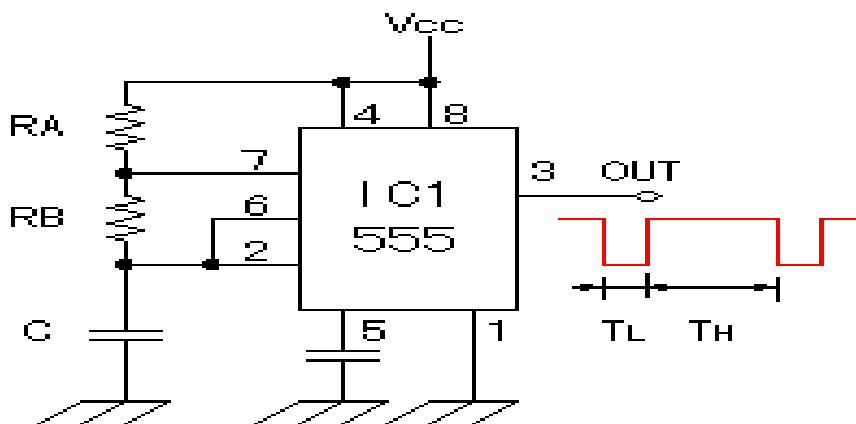
Ultrasonic sensor:

Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object. For example foam on the surface of a fluid in a tank could distort a reading.



Ultrasonic Electronic Eye Telemeter Module Through the technology of non-contacted ultrasonic measurement, ultrasonic electric telemeter module can measure a distance within 0.03-3m effectively.

Ultrasonic pulse oscillator:



The condition : $R_A = 1M\text{-ohm}$, $R_B = 15K\text{-ohm}$, $C = 0.1\mu F$

$$\begin{aligned}
 T_L &= 0.69 \times R_B \times C \\
 &= 0.69 \times 15 \times 10^3 \times 0.1 \times 10^{-6} \\
 &= 1 \times 10^{-3} \\
 &= 1 \text{ msec}
 \end{aligned}$$

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$$\begin{aligned} T_H &= 0.69 \times (R_A + R_B) \times C \\ &= 0.69 \times 1015 \times 10^3 \times 0.1 \times 10^{-6} \\ &= 70.0 \times 10^{-3} \\ &= 70 \text{ msec} \end{aligned}$$

The calculation example of the frequency is shown below.
The condition: $R_A = 1.5K\text{-ohm}$, $R_B = 15K\text{-ohm}$, $C = 1000\text{pF}$

$$\begin{aligned} T_L &= 0.69 \times R_B \times C \\ &= 0.69 \times 15 \times 10^3 \times 1000 \times 10^{-12} \\ &= 10.35 \times 10^{-6} \\ &= 10 \mu\text{sec} \end{aligned}$$

$$\begin{aligned} T_H &= 0.69 \times (R_A + R_B) \times C \\ &= 0.69 \times 16.5 \times 10^3 \times 1000 \times 10^{-12} \\ &= 11.39 \times 10^{-6} \\ &= 11 \mu\text{sec} \end{aligned}$$

$$\begin{aligned} F &= 1 / (T_L + T_H) \\ &= 1 / ((10.35 + 11.39) \times 10^{-6}) \\ &= 46.0 \times 10^3 \\ &= 46.0 \text{ KHz} \end{aligned}$$

5.2 .Programming microcontroller:

It saves you building a circuit that has separate external RAM, ROM and peripheral chips. it has many useful built in modules e.g.

EEPROM.

Timers.

Analogue comparators.

UART.

Frequency counter - using the internal timers and reporting through UART (RS232) or output to LCD.

Capacitancemeter -analogcomparatoroscillator.

Event timer - using internal timers.

Event data logger -capturing analogue data using an internal ADC and using the

Internal EEPROM for storing data (using an external I2C for high data storage capacity.

Servo controller (Control through UART) - using the internal PWM module or using a software created PWM.

5.3. RF transmitter and receiver:

General description:

RF receiver module (HT12D) receives the modulated RF signal and demodulates it. This wireless communication is done through Radio Frequency (RF) communication.

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Product description:

An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data.

5.4. Voice board:

General description:

W.TV-SR is one of the members of recording serial products. WTV-SR module can record as well as fixed voice playback, recording content uploaded and a variety of control modes can be chosen.

Product description:

The recorded voice can be uploaded to the system. It also supports download voice from PC and play recorded voice with high quality. It can record up to 252 segment voice (including fixed voice) and recording time up to 1600 seconds. It supports audio re.cording at 10 KHz or 14 KHz sample rate.



5.5. Receiver session:

Visual Basic (VB) is a programming environment from Microsoft in which a programmer uses a graphical user interface (GUI) to choose and modify preselected sections of code. VB also includes advanced features - concepts and structures which allow programs to be adapted for use with the Internet. *Visual Basic* will not run on operating systems other than Windows and on machines with non-Intel compatible processors.

VI.CLASS DIAGRAM



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Vol. 7, Special Issue 4, April 2018

VII.CONCLUSION

From the proposed system, Border Alert System for Boats Using Wireless Sensor Networks, its results and discussions proved that this system works well, and can be put forward to practical applications. The main feature of this paper is when someone crosses the border line; the client module shows indication of warning. If no response from the client, then it controls the boat from the server side module by using system control unit.

REFERENCES

- [1]https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20515
- [2] Wan, Y., Fu, S., Zander, J., et al.: 'Transforming on-demand communications with drones: the needs, analyses, and solutions'. Homeland Security Today Magazine, 2015, pp. 32–35
- [3] Fu, S., Wan, Y.: 'Communicating in remote areas or disaster situations using unmanned aerial vehicles', HDIAC J., 2016, 2, (4), pp. 4–8
- [4] Gu, Y., Zhou, M., Fu, S., et al.: 'Airborne WiFi networks through directional antennae: an experimental study'. Proc. of IEEE Wireless Communications and Networking Conf., New Orleans, USA, March 2015, pp. 1314–1319
- [5] Zhou, Y., Cheng, N., Lu, N., et al.: 'Multi-UAV-aided networks: aerial-ground cooperative vehicular networking architecture', IEEE Veh. Technol. Mag.,
- [6] M. MacEachren, A. Jaiswal, A. C. Robinson, S. Pezanowski, P. Mitra, X. Zhang, and J. Blanford, "Senseplace2: Geotwitter analytics support for situational awareness," in Proc. IEEE Conf. Visual Analytics Sci. Technol., 2011, pp. 181–190.
- [7]W. Dou, L. Yu, X. Wang, Z. Ma, and W. Ribarsky, "Hierarchical topics: Visually exploring large text collections using topic hierarchies," IEEE Trans. Vis. Computer Graphics., vol. 19, no. 12, pp. 2002–2011, Dec. 2013.
- [8]H. Bosch, D. Thom, F. Heimerl, E. Puttmann, S. Koch, R. Kruger, M. Worner, and T. Ertl, "Scatterblogs2: Real-time monitoring of microblog messages through user-guided filtering," IEEE Trans. Vis. Computer Graphics, vol. 19, no. 12, pp. 2022–2031, Dec. 2013.
- [9]D. Thom, R. Kruger, U. Bechstedt, A. Platz, J. Zisgen, B. Volland, and T. Ertl, "Can twitter really save your life? A case study of visual social media analytics for situation awareness," in Proc. IEEE Pacific Vis. Symp., 2015, pp. 183–190.
- [10]S. Vieweg, A. L. Hughes, K. Starbird, and L. Palen, "Microblogging during two natural hazards events: what twitter may contribute to situational awareness," in Proc. Conf. Human Factors Computer System, 2010,