DYNAMIC MARINE VIA MULTI-SENSOR DATA FUSION USING INTEGRATED WATER DATA TRANSMITTING

[1]Mr.S.Sivaprakasam, [2]S.Arshad Madanii, [3]K.V.Kiran, [4]K.Tamilarasan, [5]B.Vetriselvan

[1]Associate Professor, [2]Student, [3]Student, [4]Student, [5]Student
[1]Electronics and Communication Engineering,
[1]Narasu's Sarathy Institute of Technology, Salem, India

***Abstract*: Over the ambition of this special issue is to contribute to contemporary scholarly analyses of border security by bringing more focus onto a specific field of inquiry the practices of the plurality of power-brokers involved in the securing of borders. Border security is addressed from the angle of the everyday practices of those who are appointed to carry it out; considering border security as practice is essential for shedding light on contemporary problematizations of security. Underscoring the methodological specificity of fieldwork research, we call for a better grounding of scholarship within the specific agencies intervening in bordering spaces in order to provide detailed analyses of the contextualized practices of security actors.**

***Index Terms*: Marine Monitoring, Water data Transmitter, Secure Data Transmission, Ship Monitoring, Multi-sensor Data Transmission.**

I. INTRODUCTION

This paper presents a Ship watching System (SIMONS) that mixes the information inferred from artificial Aperture Radar (SAR) information with transponder-based polls [such because the Automatic Identification System (AIS) from the International Maritime Organization (IMO) In distinction to different monitoring approaches, SAR pictures square measure the main channel whereas AIS reports square measure the complementary one. SIMONS has been developed within the framework of the MARISS project . This project is a component of the series of projects (IMPAST, LIMES,) promoted by the European Commission (EC) to develop economical and reliable ship watching. the most goal is to provide authorities with a system that controls all the activities of ships and permits them to verify law compliance. different advantages would be to protect the system, to supply police work along the transportation corridors, to monitor illegal immigration and to assure property economic development. the primary operational services were developed within the early nineties and suppose the usage of active on-board transponders. There, GPS-based receivers offer real-time ship standing to watching centers via satellite communications. Such systems have proven to be terribly correct for supporting decision making however gift AN intrinsic limitation, that is expounded to the electrical device itself. Certainly, ships square measure situated if these devices square measure active, in such the way that any (accidental or intended) malfunction prevents the system from trailing them. Such lack of independence isn't fascinating for a service intended to support enforcement. More reliable solutions ought to be developed and SAR can be essential during this scenario. SAR is a microwave coherent remote sensing technology able to offer 2nd reflectivity pictures of huge scenes with fine resolutions and 24-hour all weather sensing capability. It overcomes the lack of independence of transponders, but needs image analysis and post-processing techniques to infer all the specified info. This implies the usage of models and constant quantity solutions that square measure suffering from limiting factors.

II. LITERATURE REVIEW

In the paper **— " SMART SHIP "** [1] Hundreds of the ships are lost every year because of the maritime accidents, insufficient information provided and because of the high economical costs. This paper shows how the current technologies can be used to avoid ship accidents, collisions, contacts between ships and to avoid wrecks. The paper uses a variety of sensors for collecting the data from seas and the data collected with the help of these sensors is stored on the cloud. An android application is used to monitor the ship by using the data stored on cloud. The ship which uses these smart technologies for its functioning is called Smart Ship.

In the paper **— " DESIGN AND IMPLEMENTATION OF AN IOT BASED MONITORING SYSTEM FOR INLAND VESSELS USING MULTIPLE SENSORS NETWORK "** Multi sensor networks are now widely used in various security and surveillance applications. The paper includes designing and implementing a wireless sensor network with a real time web application for monitoring multiple ships to prevent catastrophic events due to overloading. The idea consists of four main parts: Detection Module, GPS tracker, communication system (NRF24L01+) and software application for web interface. In Bangladesh, inland water transportation system is a very widely used transportation method. Many people depend largely on this transport method, especially during vacations. This country faces a huge rush of people travelling to their villages from the capital. In Bangladesh, four thousand four hundred twenty people died, five hundred twenty people injured and four hundred people missing in more than five hundred

fifty passenger ship accidents that took place in last 38 years in inland rivers of Bangladesh. According to a research conducted by Zobair Ibne Awal 33% of this inland river accidents happen due to overloading.

According to paper **— " An IoT-Based Ship Berthing Method Using a Set of Ultrasonic Sensors "** [3] It is indisputable that a great deal of brand-new technologies such as the internet of things, (IoT) big data, and cloud computing are conquering every aspect of our life. So, in the branch of marine technology, the mentioned technologies are also being applied to obtain more features and to automate marine-related operations as well as creating novel smart devices. As a result of this, traditional ports and ships are being replaced by smart ports and vessels. To achieve this transition, numerous applications need to be developed to make them smart. The purpose of this paper is to present a dedicated an IoT-based system for automating linkage procedures by searching for available locations via port-mounted sensors and planned ship notification. In the experimental system, we have used smartphone as an alternative to the client-side vessel of the system and created an Android app called "Smart Ship Berthing" instead of the charging program, for instance, NORIVIS 4, VDASH, ODYSSEY, etc. To test our proposed server-side system, we used Raspberry Pi with a combination of an ultrasonic sensor to detect the ship and modify the empty berth for anchoring. The experimental results show that the set of UR sensors have high accuracy to detect ships at the port for ship berthing and our proposed system is very amenable to implementation in the real marine environment.

III. PROPOSED SYSTEM

A real-time wireless monitoring solution for urban water distribution systems (WDSs). The Awa system is composed of a distributed network of low-cost sensor nodes that can be quickly installed on water pipes. Rather than using conventional radio signals, which are attenuated in underground environments, the nodes use the actual water-filled pipe as the transmission medium to communicate with one another. Most of the current WSN systems for area monitoring are multi-layered systems. To overcome the drawbacks of multilayered systems, explained in Section II, we propose a flat, modular system architecture to offer timely, mission-centric event detection. The proposed architecture is open to any hardware platform and does not assume any sensing modality. Flat systems comprise a set of Basic Sensor Nodes (BSN), which collaborate to detect and report events. Figure 1 shows the block diagram of the proposed model.

Proposed Block Diagram

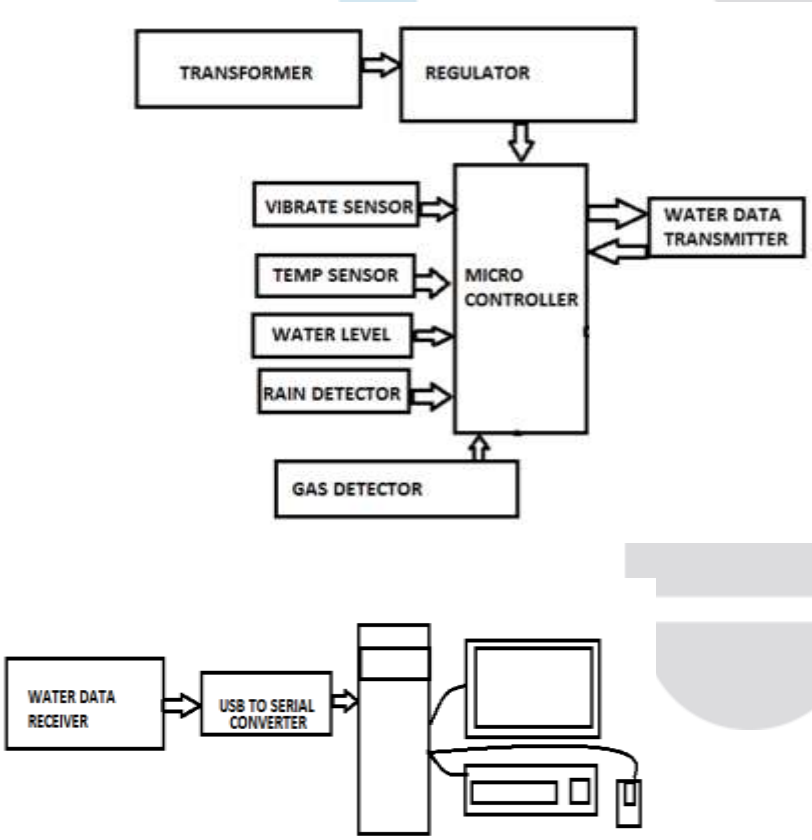

Fig. 1

IV. HARDWARE IMPLEMENTATION

Battery

The battery, that is shown in the figure 2, is an essential component of almost all aircraft electrical systems. Batteries are used to start engines and auxiliary power units, to provide emergency backup power for essential avionics equipment, to assure no-break power for navigation units and fly-by-wire computers, and to provide ground power capability for maintenance and preflight checkouts. Many of these functions are mission critical.

Fig. 2

Fixed Voltage Regulator

The series 78 regulators provide fixed regulated voltages from 5 to 24 V shows how one such IC, a 7812, is connected to provide voltage regulation with the output from this unit of +12V Dec. An unregulated input voltage VI is filtered by capacitor C1 and connected to the IC's IN terminal. The IC's OUT terminal provides a regulated + 12V which is filtered by the capacitor C2 (mostly for any high-frequency noise). The third IC terminal is connected to ground (GND). Figure 3 shows the circuit diagram of voltage regulator

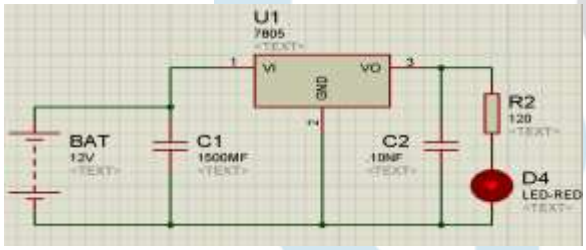

Fig. 3

Micro Controller

The high-performance, low-power Atmel 8-bit AVR RISC-based microcontroller combines 16KB ISP flash memory, 1KB SRAM, 512B EEPROM, an 8-channel/10-bit A/D converter (TQFP and QFN/MLF), and debug WIRE for on-chip debugging. The device supports a throughput of 20 MIPS at 20 MHz and operates between 2.7-5.5 volts. By executing powerful instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed. Figure 4 shows the pin diagram of the ATMEGA 328 micro controller.

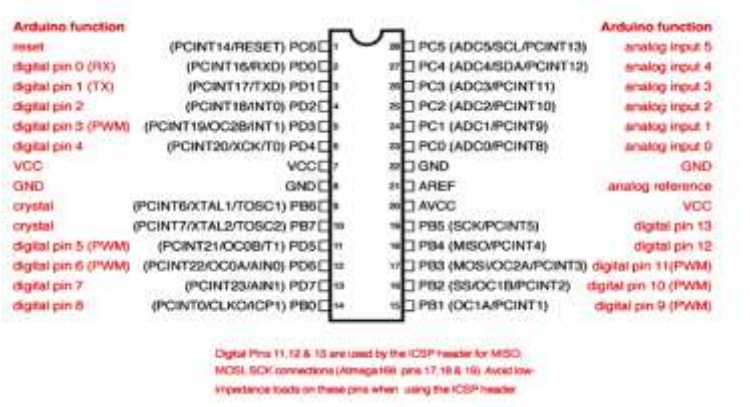

Fig. 4

V. CIRCUIT DIAGRAM

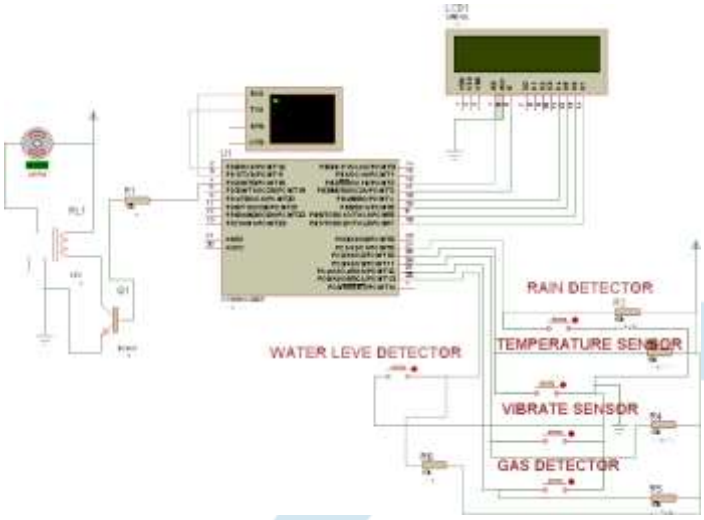

Fig. 5

VI. CONCLUSION

A smart technologies such as sensors, cloud and mobile applications are presented. This paper also discusses about the benefits of using these technologies on board in order to prevent maritime accidents. It also has benefits such as on small boats now, it is not necessary to spend a lot of money on marine electronics hence cheap electronics. Applications could use the internet connection to share information of the own ship. Applications to aid to navigation can be implemented, adding algorithm to alert the users about danger situations and avoid collisions. Another advantage is that the application market of smart devices is very wide and dynamic, with a fast growth on applications and developers. Hence a smart ship project can be helpful and user-friendly in marine transport.

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