

Ship locating device with the provision of notification for fuel/fire accident

Neha Vijay Patil¹, Snehal Laxman Patil², Prerna Shahaji Kokate

^{1,2,3}*Department of Electronics and Telecommunications, DYPIEMR, Pune (India)*

ABSTRACT

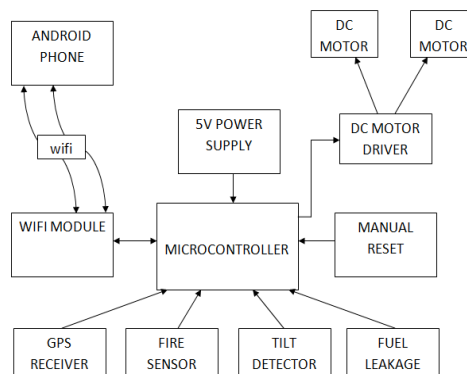
This paper demonstrates a system which is used for multiple safety based notifications and also to obtain the location of the system. The main components that are being used in the system are three-axis accelerometer, Global Positioning System, temperature sensor, DC motors and fuel leakage sensor. This system has been designed to basically provide the location co-ordinates of the system in the form of latitude and longitude, the magnitude of tilt (if the system has faced any), detection of fuel leakage (if present), detection of any kind of fire accident taking place around the system (leading to explosion), and also the provision of moving the system forward or backwards using the motors. Wi-Fi facility has been chosen as the medium of communication between the system and the application on mobile phone. The mobile and the system act as the transmitter and receiver or vice versa. The intention is to develop a low cost model designed to contribute to the society for safety purposes.

Key words: explosion, fuel, Wi-Fi, co-ordinates, three-axis accelerometer, safety.

I.INTRODUCTION

Considering today's safety related problems, a lot of accidents are taking place on roads as well as in waters. Digging deep into these issues made us realize that water based accidents when neglected may lead to fatal consequences which mainly include water pollution. So this system is the first step to taking care of our water bodies and healthily making use of water transport as a facility to for the purpose of communication and exchange of material. The GPS facility makes it easy for the desired user to access the location of the system as and when required. This facility is given keeping into mind the problem of piracy. The agenda behind integrating the two mentioned sensors is for the awareness of any kind of fuel leakage or fire based accident taking place so that required steps can be taken before the accident converts into a life threatening event. Since mobile is a portable device, it makes it easier for the user to access the data from anywhere, anytime. The user can also move the ship forward or backwards using the application. The main focus is on using devices which are economical so to a present this module which only illustrates the idea that has emerged in our mind. This system can be implemented in any area that requires the above stated facilities.

The idea behind the project is to prevent such accidents as they result in increase in water pollution and hence, disturb the eco-system.



II. DYNAMIC MODEL OVERVIEW

This system is built using the AT mega 32 micro-controller to which other devices are integrated. A 5 volt power supply is given to drive this system. The Wi-Fi module used here is ESP8266 which acts as a medium between the application and this hardware system. An ultra compact GPS pot- L80 has been used for obtaining the co-ordinates. LM35 temperature sensor is used as the fire accident indicator whose output voltage is linearly proportional to the temperature (in Centigrade). For every degree centigrade, it gives 10 milivolts output. To identify tilt, a 3-axis accelerometer has also been integrated whose readings are in the form of voltage with respect to the axes. Any change in the reference voltages with respect to each axis, indicates tilt which may be in the form of roll, pitch or yaw. MQ-35 gas sensor is used to detect fuel leakage. The resistance value of the MQ-5 sensor varies proportionally to the concentration of various gasses. It gives high output if leakage is detected.

III. SIMULATION ENVIRONMENT

To test the working of the system, we used the ISIS tool along with Proteus software. This simulation lets us know whether the working of the system designed gives us the desired output of no. Attention (AT) commands are being used for this system and the programming language used is Embedded C. If the simulation is apt with respect to the required output, it makes the further steps easy.

IV. ACKNOWLEDGEMENT

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V. RESULTS AND DISCUSSION

The research carried out for the development of this model and the observations to led us to the conclusion that water bodies also experience trafficking similar to roads because of the increasing demands for maritime (water based) transport facility. This facility is being widely used for the purpose of exchanging of material that is,

importing and exporting. Hence, if proper care for safety is not taken, it may lead to fatal accidents resulting in loss of resources and human lives.

Also, next problem that was observed is weather (mainly cloudy skies). These conditions significantly affect the communication between stations and hence, are not feasible. The solution to this problem is discussed in the conclusion section.

The tilting of the ship can be a result of either tides or another ship passing the ship. When another heavy body passes the ship, roll, pitch and yaw are observed. This may lead to the ship going off course and hence is clearly an important parameter to consider.

VI. CONCLUSION

This model demonstrates the access to the location of the system in the form of global co-ordinates by the user as and when required. It also detects any tilt experienced by the system in the waters (implementation based). Any type of fire or fuel leakage related accidents are also notified to the user via the application present on his Smartphone. This system has been developed to contribute to the society in a way. When implementing it on a large scale, which will even require a large amount of investment, more facilities can be added.

Few of them are listed below:

- One of them can be notification to the nearest fire station in case of any accident.
- The other may be obtaining a dedicated server and uploading all the data on it so that the data can be accessed irrespective of the reception problem faced by the phones.
- Using jammers and/or encryption to secure any important data.

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