UNDERWATER WIRELESS DATA TRANSFER USING IRSENSOR AND ARDUINO

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Abstract

Underwater wireless communication system makes use of two communication modules which transmits and receives data using infrared radiation. Each module consists of both transmitter andreceiver which transmits and convert received data. Wireless infrared (IR) communication system ismeant to use free space propagation of light waves as a transmission medium in near infrared band this system has many advantages such as is an inexpensive and the transmitter and receiver can be showed to another location with least distraction. This system is used for easy communication with transmitterand receiver in underground water. The system consists of acknowledgement receipt message that sentback from receiving circuit to the transmitting circuit on the message receipt. This allows for efficient communication between two circuits wirelessly this paper puts forward an effective way of secured under water communication.

Keywords: Arduino uno, 16*2 lcd display, keyboard, IR Tx&Rx module, underwater communication,IR wave

I. INTRODUCTION

Various authors have proposed anddiscussed much advancement in educational field using technology that has helped in improving educational field Arnone, S. Underwater optical wireless communication network. Many underwater communication deployments use acoustic or low frequency technologies, which is why the number of works in higher frequencies is very scarce. We have found some papers showing comparative studies regarding the transmission characteristics of the acoustic, optical and electromagnetic signals in underwater environments.

There is a huge variety of articles describing the propagation of acoustic waves. An example of a path loss analysis given by the reflection andrefraction of the waves is provided in. Moreover, we can see in the effects of depth and temperature in this type of wave.

II. LITERATURE SURVEY

The terrestrial sensor network and underwater sensor network are different in many factors. The comparisation between terrestrial sensor network and underwater sensor network are bellow.

➢ **Signal**: In the terrestrial sensor network there are radio signal will be used but in underwater sensor network there are acoustic signal will be used because radio signal will work with extra low frequency so it can not travel far in underwater so it is not feasible.

➢ **Power**: In underwater sensor network power required is more compare to terrestrial sensor network because the signal will travelling in water medium and the another reason is high distance among sensors and complex environment.

➢ **Memory**: In terrestrial sensor has limited storage capacity but underwater sensor may need to be able to do some data caching so, its require more memory.

➢ **Cost:** Underwater sensors are more costly whereas terrestrial sensors are not more costly compare to underwater sensors and moreover the underwater sensor require additional hardware protection system.

Today very increasing demand to some special routing protocol which can work efficiently .For the current point of research scenario underwater sensor network with some different routing protocol available which play some specific role in underwater sensor network[3] . There are mainly four protocol family in underwater sensor network.

1) Flooding based routing protocols

2) Multipath based routing protocols

3) Cluster based routing protocols

4) Miscellaneous based routing protocols Flooding based routing protocols: In the flooding based routing protocols the node transmitting the packet to all other node within transmission range. There are many protocol in flooding based family like HH-VBF(hop- by-hop vector based forwarding protocol),DBR(depth based routingprotocol),FBR(focus beam routing protocol), HHDAB (hop-by hop dynamic address based routing protocol),SBR- DLP(sector-based routing with destination location prediction) etc. Multipath based routing protocols :In multipath based there are more than one path are establish from source node to destination node. In multipath based routing include Winston et al. Scheme, Dario Pompili et al. Scheme, MPT etc. Cluster based routing protocol: In this types of scheme there are group of node. There are two types of node in this scheme, cluster head node and cluster member node .In cluster based include MCCP(minimum cost clustering protocol),DUCS(distributed underwater clustering scheme),Hydro cast etc. Miscellaneous based routing protocols: In miscellaneous based protocol include adaptive, ICRP(information carrying based routing protocol), phero -trail etc.

III. EXISTING SYSTEM

We can also find a variety of studies about the propagation and losses in optical communications. Wells, I.; Davies, A.; Che, X.; Kear, P.; Dickers, G.; Gong, X.; Rhodes, M. Node pattern simulation of an undersea sensor network using RF electromagnetic communications. In RF communications, researchers work with Very Low Frequency (VLF), decreasing the frequency in order to have a more effective range of communication. Concretely, some researchers of theSwansea Metropolitan University, U.K Underwater wireless communication system makes use of two communication modules which transmits and receives data using infrared radiation. Each module consists of both transmitter and receiver which transmits and convert received data.

IV. PROPOSED SYSTEM

Almost no other systems to watch the health conditions of sea navigator while navigating the sea. While there is a wearable device for monitoring his/her pulse for himself/herself. But an individual within the ground cannot find about the health conditions of person underwater. So, he does not realize the health conditions of the person underwater. Fig 1: A Scuba Diver Diving equipment is equipment employed by underwater divers to form diving activities possible, easier, safer and comfortable.

This might be equipment chiefly intended for this purpose, or equipment intended for other purposes which is found to be suitable for diving use. The fundamental item of diving equipment is an underwater breathing device, and surface supplied diving equipment. But there are no other important pieces of kit that make diving safer, more convenient or more efficient. Diving equipment employed by recreational scuba divers is usually personal equipment carried by the diver, but professional divers, particularly when functioning within the surface supplied or saturation mode, uses a good deal of support equipment not carried by the diver.

V. SOFTWARE

Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such asWindows, Mac OS X, and Linux. It supports the programming languages C and C++. IDE stands for "Integrated Development Environment" it is an official software introduced by Arduino.cc, that is mainly used for editing, compiling and uploading the code in the Arduino Device. Almost all Arduinomodules are compatible with this software thatis an open source and is readily available to install and start compiling the code on the go Arduino IDE Definition 1.Arduino IDE is an open-source software that is mainly used for writing and compiling the code into the Arduino Module. 2.It is an official Arduinosoftware, making code compilation too easy that even a common person with no prior r technical knowledge can get their feet wet withthe learning process. 3.It is easily available for operating systems like MAC, Windows,Linux and runs on the Java Platform that comes with inbuilt functions and commands that play avital role for debugging, editing and compiling the code in the environment. 4.A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro and many more. 5.Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code. 6.The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board. 7.The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.

VI. METHODOLOGY

The Alcohol Detection with Engine Locking system helps to reduce accidents which are occurring

due to drunk driving. MQ-3 sensor detects the presence of alcohol in the surroundings. The sensor provides output on the basis of the concentration of the alcohol, ifthe alcohol concentration is higher the conductivity of MQ-3 sensor increases which in turn gives the reading to ARDUINO. If the reading is greater than the threshold level, ARDUINO will stop the DC motor. The red LED will also blink if the distance is less than the safe distance to give indication to other vehicles that the vehicle in front of them is unsafe. Now, with the help of SIM900A the message will be sent to the respective authorities that focus on the particular vehicle is unsafe.

ADVANTAGES

- Low Power consumption
- It Avoids Data Leakage
- It Avoids Data Spoofing
- Pollution Monitoring

APPLICATIONS

- Wireless communiation between submarines and communication host.
- Water based vehicles can easily communicate using this project.
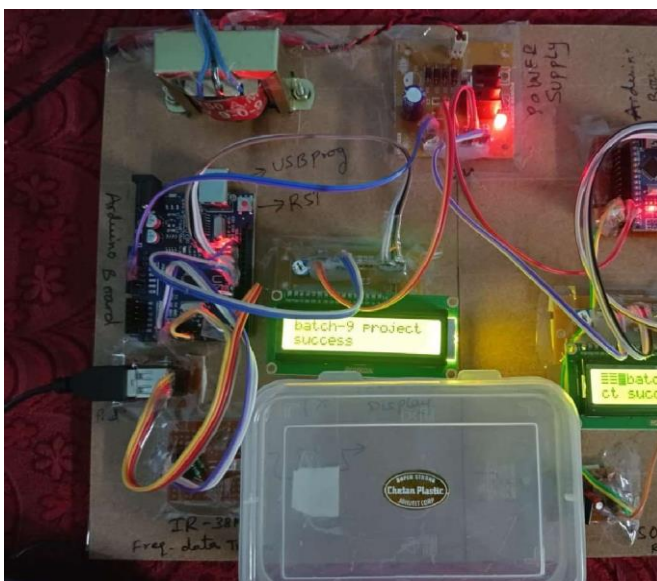
VII. EXPERIMENTAL RESULTS

Figure.1: Final project

Figure.2: Transmitting Section

Figure.3:ReceivingSection

VIII. CONCLUSION

Despite much development in this area of the underwater wireless communication, there is still an immense scope so more research as major part of the ocean bottom yet remains unexploded. The main objective is to overcome the present limitations and implement advanced technology for oceanographic research and cope up with the environmental effects on the noise performance of acoustic systems to compete with the future challenges like effective transmission of audio and video signals etc.

IX. FUTURE SCOPE

The future of wireless networks will be much faster than today's technology. This increased speed will enable wireless connectivity to become a part of more areas of our lives and power advanced, data-hungry applications. Dependability: Wireless networks will also become more reliable as technologies improve.

➢ Trust and Integrity in Data Transmission.

➢ Fault tolerance, Flexibility and Security.

➢ Improvisation of Multiple Access Technique in underwater wireless communication.

➢ Secure PHY and MAC layers in Acoustic Communication.

➢ Traffic Congestion Monitoring and Management.

➢ Advance Time Synchronization Method for Data Transmission.

➢ Adaptive Routing Technique for Multi-hop Communication.

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