AQUABOT

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ABSTRACT

Underwater wireless communication is one of the ma- jor challenges faced in the field of technology.Under- water wireless information transfer is of great interest as there's a rise in number of vehicles anddevices de- ployed there, which require high bandwidth and thus high capacity for information transfer. It was pro- posed and has received maimum attention in the last decade. Successive progress has been made in this field but there has been a simultaneous limitation as well, as a result of which acoustics was replaced by infrared waves (IR). The signal that is pulsed is passed through the modulation circuit and is provided to the light emitting diode that transmits pulsed burst of IR radiation to light sending diode within the second communication module. Subsequently, an appropri- ate approach is selected for the communication with minimum loss and maximum distance.This paper puts forward an effective way of secured under water com- munication.

Keywords:wirelesscommunication,Robotics aquatic,Ecosystem,Underwater vehicle.

I. INTRODUCTION

From many years underwater wireless communica- tion is one of the major challenges faced .This infor- mation transfer is of great interest as there is a rise in number of vehicles and devices which require high bandwidth and thus high capacity for information transfer. It was proposed and has received maximum attention in the last decade. Successive progress has been made in this field but there has been a simulta- neous limitation as well, because of which acoustics was replaced by infrared waves (IR). Various kinds of difficult work can be done easily using underwater ro- bot in ocean or any other source of water. The im- portant part of this proposed project is all parts of this robot have to be waterproof. The major challenge of this project is to provide isolation an underwater re- search platform must be waterproof, reliable, robust, recoverable and easy to maintain.

An underwater robot invent various sensors and com- munications systems that allow for swarm robotics re- cent advances in sensing and intelligent control

technologies open a whole new dimension in under- water autonomy. However, before truly capable, au- tonomous underwater robots can be created for sub sea intervention and exploration, many research issues must be first investigated and developed experimen- tally on test platforms.

According to NOAA (2017), nearly95 percent of the ocean realms remain unexplored and unseen by hu- man eyes and its exploration has been gaining lots of interest in the past decades with the emergence of off- shore mining for metals and pressing needs to under- stand the driving forces of natural occurring phenom- ena such as hurricanes and tsunamis that continue to threaten human safety and damage infrastructures. Robotics engineering is a combination of mechanical engineering, electrical engineering, and computer sci- ence. Today robotics engineering covers a vast num- ber of fields including healthcare, fire safety, cooking, children's toys, and more. Some of the most important areas are those where humans are at risk of their life, and a robot could reduce the risk to the human. For example, in a situation where a person has fallen through ice or otherwise drowned in a body of water, those recovering the body are at a serious risk.

The rescuers have the risk of drowning or suffering from hypothermia in cold tempera- tures. Therefore, a robot that could do the search for them eliminates the danger of be- ing underwater for too long and could do the search for them eliminates the danger of be- ing underwater for too long and could be used as a guide for the recovery of the body

As a solution to this problem, this project is implemented a robot that could perform the task. Our robot, the Aquatic Robotic Recov- ery Craft (ARRC) aims to solve this problem by searching for a missing person in any type of water. Remotely Operates Vehicles, ROVs, are underwater robots controlled by an individual on the surface. They usually communication with the control station

through a tether. This work presents the design of a low-cost small underwater robot for mud samples pick up and compares its estimated overall cost with the ROVs, existing in the market. The design study presented in this document covers the mechanical, electrical, and software parts of the vehicle Prototype.

II. OBJECTIVES

➢ To design an underwater communication using a robotic, which helps in finding the materails or objects that has been lost in the underwater.

➢ To detect the status of the aquatic creature.

➢ To create the sample of sand, Inages of new aquatic species and plant for research

III. LITERATURE SURVEY

Khalil Mahmood Awan, Peer Azmat Shah etc.all Mentioned about an optical communication-based system will have the high propagation speed. But suspended particle in water causes back scattering and hence there are affected by the turbidity of the water. Acoustic waves are less sensitive to the suspended fine particles within water and turbine than the optical waves. They are the most used methods due to their ability to reach long distances. However, it has some main drawbacks, like low data rate. That data rate is limited by strong reflections and attenuations as well as poor performance in turbid water with large parti- cles, salinity, and environmental sensitivity. This pa- per describes the Underwater sensor network has sev- eral vehicles and sensors that are deployed in a spe- cific area to perform collaboration monitoring and data collection tasks. Traditionally for the monitoring of ocean bottom, oceanographic sensors are deployed for recording data at a fixed location and recover the instruments at the completion of task. The major disadvantage of this approach is lack of interactive communication between different ends. Major challenges for the dign of acoustic network are spectrum sensing, dynamic power control, spectrum sensing strategy, etc. Therefore, routing and media access control protocols need to be designed by taking his care of maximizing the channel utilization.[1]

Mohammed Furqan Ali, Dushantha Nalin K.etc.all This paper described about the deals with monitoring different activities in an underwater envi- ronment. Due to these reasons, under-water wireless communication has become a significant field. Opti- cal, acoustic and electromagnetic waves are widely used for data transmission. Investigation of possible techniques has a huge impact on wireless communi- cation. Nowadays, this system is being used for

experimental observation, oceanographic data collection and analysis, underwater navigation, disaster prevention and early detection warning of a tsunami.[2]

Mr. Velu Aiyyasamy, K Rengarajan etc.all. Presented a underwater wireless data transmission is of great interest as there is a rise in number of devices deployed underwater, that require a very high bandwidth and thus high capacity for data transmission. Several advancements have been made in this field using acoustics, but it has limited bandwidth. Electromagnetic waves are an alternative to acoustics. These waves, within the radio frequency range, are a suitable option for underwater wireless communication when used for high-rate transfer over a short range of distance.[3]

Muhammad Tahir etc.all. Presented this paper focuses on physical properties that can be observed via electromagnetic radiations which include the following: ocean surface wind stress, surface wave spectra, sea surface topography, sea surface temperature, and sea ice cover, etc. It also deals with the challenges face by electromagnetic waves in underwater environ- ment which includes, Interaction of radio frequency with sea surfaces, emission of radio and microwave energy from the sea surface. The demand for security of underwater communication is growing tremendously. Especially for the defence application purpose, the secrecy of the data must be maintained. To achieve this suitable algorithm must be implemented. And hence we make use of cryptography techniques to encrypt the data and prevent information leakage. The technique used in this paper is RSA algorithm. This algorithm is easy to implement, and it is secure. RSA is an asymmetric type of encryption. The RSA this algorithm can be implemented using c language or python and fed to the Arduino or to the raspberry Pi.[4]
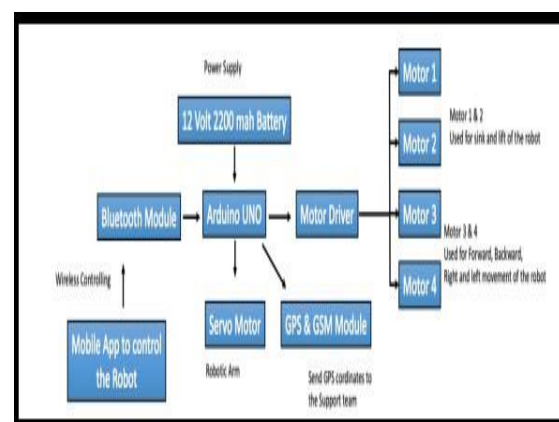
IV. Working Principle

Figure 1:Block daigram of Aquabot

This proposed method is for develop an underwater robot.The design involves two stages:Designing circuit diagram by four motors: Motor 1 and 2 are used to pull up the robot up or down and Motor 3 and 4 are used to move forward and backward. The model makes use of a mobile application to control the robotic Arm via through Bluetooth that is connected. The Bluetooth module in the robot receives the signal and send it to the Arduino, which is connected with motor driver shield and this controls the entire robot that is powered by 12 volts with 2 Amps of battery. GPS (Global positioning system)is a satellite based navigation system.It provides time and location based information to a GPS receiver located in underwater.It locates the location using the GPS Which has been attached to it.

GSM(Global system for mobile communication).It is a digital cellular technology used for transmitting mobile voice and data service and mainly to get the message.

V.   RESULTS

These robotic,unmanned submarine platforms that provide access to areas that may be explored otherwise may not be explored and act a s force multipliers The major drawback is that if the presence of human is lost, and visual surveys and evaluations may lead for more difficulties.

Sl.no	Distance travelling	Weight lift capacity	Capturing capacity
1	50 meter	50 grams	16MP 4K

Figure 2:Snapshot of Aquabot

VI. CONCLUSION

Despite of much development in this area of underwater wireless communication, there is still an immense scope so more research as major part of ocean bottom yet remains unexploded. To overcome the present limitations and implement advanced technology for oceanographic research and scope up with the environmental effects on the performance of the underwater wireless communication systems to compete with the future challenges by the effective transmission of audio and video signals etc. Also, the above proposed system seems feasible to achieve high data rate transmission with low propagation delay as far as short distance communication is concerned.

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