

UNDERWATER ROBOT USING RASPBERRY PI WITH WIRELESS COMMUNICATION

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Abstract

In this project we introduce three types of enhanced wireless control system for the robot operate under water. Specially base on raspberry pi and raspberry pi is run by using python language is high level language. For robot mobility action under the water wireless communication is efficient. Once the communication occurs then we can easily operate underwater robot or vehicles from a communication device at the surface. Robot is going to control under the water using Zig bee wireless communication system. The robot will be operated on the water to detect underwater metal resources. Underwater wireless communication and can be used for civilian and military application such as data collection, specific ocean sampling, pollution and environmental monitoring with using modern controller.

1. Introduction

The robot will be operated on the water to detect underwater metal resource. Underwater wireless communication can enable many civilian and military applications such as oceanographic data collection, scientific ocean sampling pollution and environmental monitoring, climate recording, offshore exploration, disaster prevention. Assisted navigation, distributed tactical surveillance, and mine reconnaissance. Some of these applications can be supported by underwater acoustic sensor networks (UWASNs), which consist of devices with sensing, processing and communication capabilities that are deployed to perform collaborative monitoring tasks. To make underwater applications viable, real-time communication protocols among underwater devices must be enabled.

2. Review

The robot is designed to move as per the command given by the controller. There are no robot samples and talk the people which are in front of the robot. There are most type of robot are available which android controlled, pic controlled, RF underwater robot, DTMF, Bluetooth or Internet.

2.1 Raspberry pi

The Raspberry Pi using here for power consumption and save the power is small light weight and active there Wi-Fi GPS, camera, Ethernet, USB, many other features are present. The Raspberry Pi makes the size of light weight. Reactive and give fast result.



2.2 Temperature Sensor

Temperature sensor using LM35 series are precision integrated –circuit. Temperature range is - 55°C to 150°C. Not required to subtract a large constant voltage. Properly give perfect temperature

2.3 Zig bee

Most of the use Zig bee for communication in under water is suitable because Zig bee/mesh and proprietary peer to peer mesh topologies 2.4 GHz for worldwide deployment fully interoperable with other and multiple antenna option

2.4 Metal Detector

Like the surf wading metal detectors, detectors used for shipwreck treasure hunting are also designed to overcome the effects of highly mineral based salt water and magnetic black sand and can be used on beaches and in shallow water. They only differ from other Under water metal detector by their ability to withstand the higher water pressure at greater depths. These detectors are depth down to 200feet and normally have better volume control for hearing through a neoprene hood. Most of these underwater metal detectors have the search coil permanently attached to the control box. Search coil designs for deep underwater search have an extra weight. Since underwater metal detectors is impossible without headphones, most underwater metal detector have the headphone hard wire to the control box.

3. BLOCK DIAGRAM

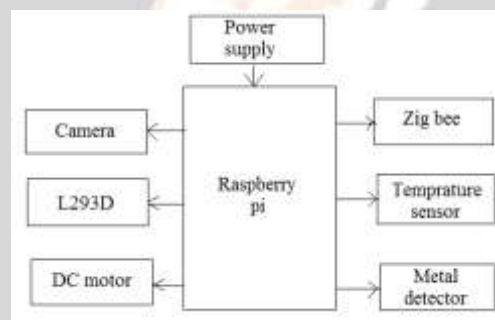
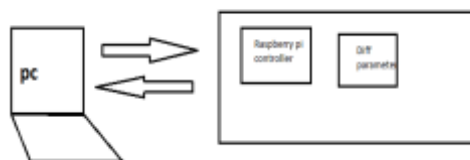


Fig1. Block diagram

Underwater robot have controlling using the Zig-bee module & Raspberry pi with Wi-Fi uses controlling the robot along with data receiving ,temperature ,mental detector module will all process have the conditional data will be process provide. The robots have to be controlled to the Raspberry pi and PC. Zig-bee has to be use the underwater module communication module.

This robot is indirectly controlled through internet. The android is a software stack for mobile device that include an operating system, middleware and key application.



The fig show that the basic method of that project. Android boasts a healthy array of connectivity option, including Wi-Fi, Bluetooth, and wireless data over a cellular connection. Pc will be provide access to wide range of useful libraries and application. one of who is controller the robot can view what is going in front of robot and under water robot have to be communicate that Raspberry pi module.

4. Advantages

Automatically controlled: Aqualon is automatically controlled because of which human efforts are reduced and required man power can be used in other operations.

- Multipurpose: The robot can be used in multiple operations and can be worked for the different and multipurpose systems.
- They can endure physical conditions that are uncomfortable or even dangerous which causes risk to humans. The robot can easily be handled in such situations.
- They can operate in airless conditions where oxygen or air not present and human can't go the robot can move there and can perform operation in better way.

5. Applications

- Marine Biology: Observe natural structures like coral reefs to measure growth and change Return to sites over time or under varying conditions to observe change Observe many animals to determine population or group behavior follow individual creatures to observe behavior.
- Marine Geology: Survey and mapping of underwater structures. Follow precise transects of the sea floor. Repeated observation of dynamic geologic features.
- Underwater Inspection: Perform anomaly detection on cables, pipes, piers, rigs, and other artificial structures. Maintain a fixed position and orientation in rough seas (station keeping).
- Underwater Assistant: Follow diver automatically, maintaining safe standoff. Avoid obstacles of other divers. Dive to depths beyond diver's limit to make observations/locate dropped objects.

5. Conclusion

The implementation of underwater robot using Raspberry Pi with wireless communication is successful. The communication between different modules is perfect without any interference. The design met all the required specification. Eagle is the software tools used. The performance of the system is more efficient when methodology of placing an android module (Raspberry Pi). The robot instead of GPRS controlled underwater robot. Pc machine using Raspberry Pi board working has been verified in the hardware. It can be concluded that placing android mobile in the robot and controlling it provides portability and flexibility.

6. References

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