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Water Quality Monitoring System using RC Boat with Wireless Sensor Network

Mr. Aakash Pramod Adake[1], Dr. Manasi Dixit[2]
[1]*M.Tech in Electronics and Telecommunication Engineering,* [2]*Professor in Department of Electronics Engineering,*
[1, 2]*Department of Electronics Engineering, Kit's College of Engineering (Autonomous), Kolhapur Maharashtra, India*

Abstract: ***The aim of this project is to implement the RC boat and get the real time water quality using different wireless sensors such as Ph sensor, Turbidity sensor, water temperature sensor and air temperature and humidity sensor etc. This paper presents the different sensors interfaced to the controller (raspberry pi 3) and uploads the data to the cloud based server (thingspeak). The proposed system contains the camera which shows the visual output to find the location of boat. The RC boat is operated on the 2.4 GHz frequency band.***

I. INTRODUCTION

The water quality monitoring is very important now a days. As there are various resources available but still no progress. In most cases the water gets contaminated due to different reasons and one of the major reason is industrial waste. This needs to be stopped somewhere. To cure this real time monitoring of water quality should be done. So the RC boat is used for continuously moving on water surface to identify water quality. The different sensors are interfaced to the controller viz. water temperature sensor, air temperature & humidity sensor, Ph sensor, Turbidity sensor, conductivity sensor. In addition, the camera is interfaced to controller for getting the live video of the present location of boat. The interfaced sensors are placed on boat and the real time data can be obtained once the boat moves over the water surface. This real time data is uploaded on to the cloud server. Once the data is uploaded the parameters are observed and analyzed.

II. PROPOSED METHODOLOGY

The sensors interfaced are Ph sensor, Turbidity sensor, Water Temperature sensor, Air Temperature and Humidity sensor to Raspberry Pi-3 B model. The different readings are taken and the output of each sensor is generated on the terminal window using Python script.
The readings of sensor generated on terminal are uploaded on Thingspeak cloud server and the real time parameters are uploaded.

III. BLOCK DIAGRAM

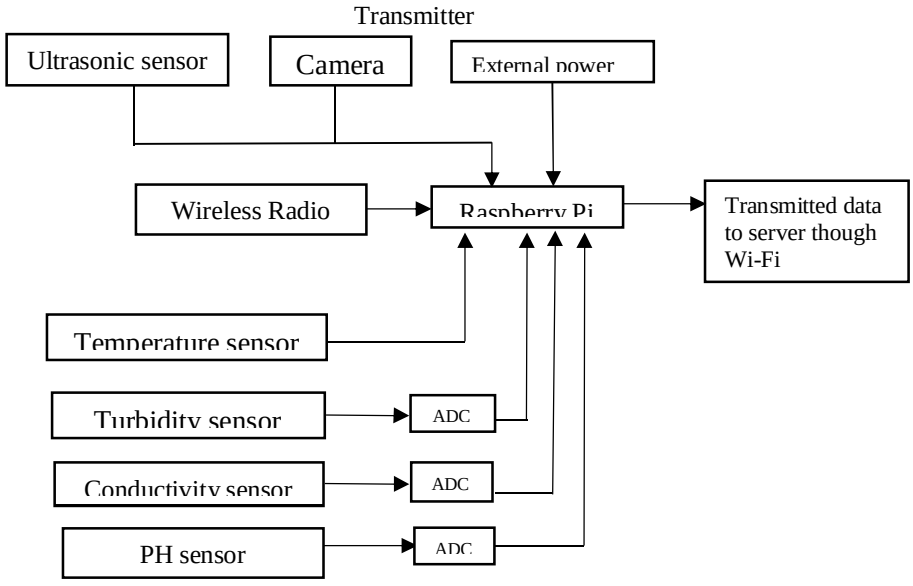


Fig – Block diagram of transmitter

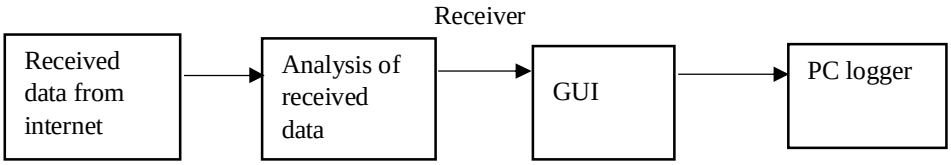


Fig – Block diagram of receiver

The transmitter and receiver are shown. The raspberry pi 3 B model is used and the different sensors interfaced are Air temperature and humidity sensor, water temperature sensor, ph sensor, turbidity sensor, ultrasonic sensor and camera. The sensor data is collected into the raspberry pi and this real time data is uploaded on the thingspeak cloud server. The camera output is observed on web browser. The ADC is used to convert the Ph sensor and Turbidity sensor analog signal to digital. The cloud server data is observed and saved the data to GUI in PC.

IV. SENSORS AND READINGS

A. PH Sensor Readings

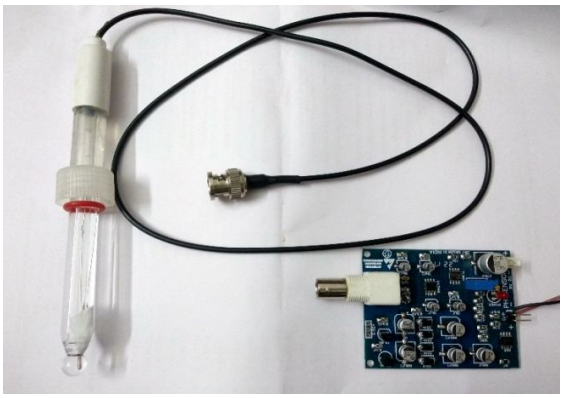


Fig – Ph sensor

TABLE I
PH SENSOR READINGS

Sr. no.	Type of water sample	Actual Readings (Ph range)
1	Simple Water	6.9 – 7.2
2	Ph 9	8.5 – 9.3
3	Ph 4	3.5 – 4.5

B. Turbidity Sensor Readings

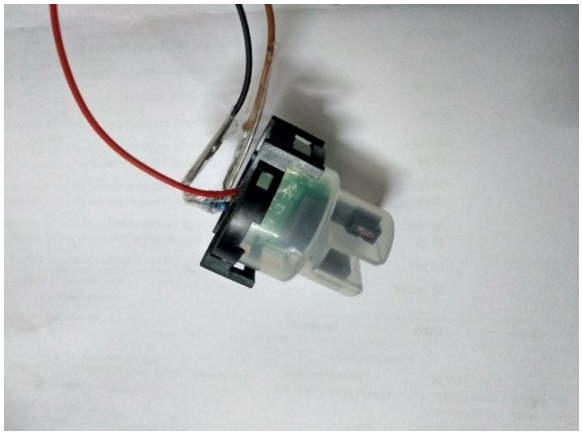


Fig – Ph sensor

TABLE III
TURBIDITY SENSOR READINGS

Sr. no.	Type of water sample	Actual Readings (NTU)
1	Simple Water	400 – 420
2	Mud Water	120 – 160
3	Waste Water	250 - 350

C. Water Temperature Sensor (DS18b20) Reading

TABLE IIIII
WATER TEMPERATURE SENSOR READINGS

Sr. no.	Type of water sample	Actual Readings (degree Celsius)
1	Normal Temperature	22 – 24
2	Hot Water	25 – 60
3	Cold Water	25 - 0

D. Air Temperature and Humidity Sensor (dht11) Reading

TABLE IVV
Air temperature and humidity sensor readings

Sr. no.	Different mediums of air	Temperature (Degree Celsius)	Humidity (Percentage)
1	Normal	22 – 30	50 – 60
2	Closed/covered sensor	22 – 15	60 – 100
3	Fire stick	25 – 60	60 – 20

V. OVERALL SYSTEM

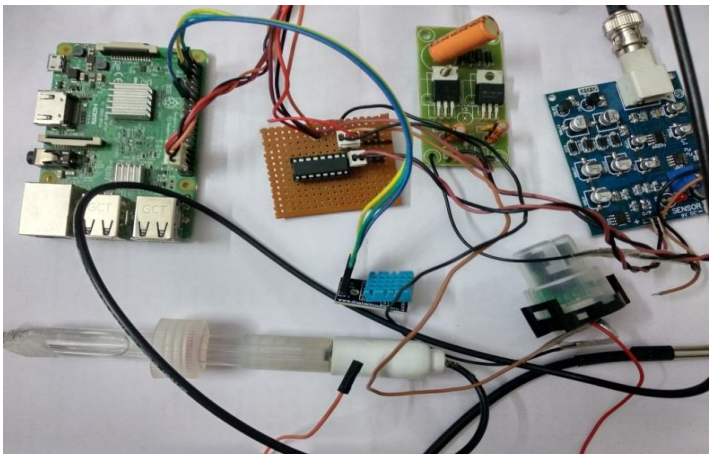


Fig – Full system

VI. CONCLUSION

In this project the remote operated boat is provided which finds the real time water quality. This project is done to acquire the best and worst real time water quality using the RC boat which leads to find the area where the bad pollutants are present and are getting added. Different sensors find the parameters of the water which tends to grade the quality of water.

VII. ACKNOWLEDGMENT

A special thanks to all the members of chemistry department of KIT's College of Engineering Kolhapur, they helped by providing the different standard Ph value samples for testing Ph sensor and also provided different useful equipment's for this research and implementation. I would like to thank the cutting technician for helping in cutting foam material to make rc boat.

REFERENCE

[1] Arjun K, Dr. Latha C A, Prithviraj, "Detection of Water Level, Quality and Leakage using Raspberry Pi with Internet of Things", International Research Journal of Engineering and Technology Volume: 04 Issue: 06 | June -2017 e-ISSN: 2395 -0056 p-ISSN: 2395-0072.

[2] Cho ZinMyint, Lenin Gopal, and Yan Lin Aung, "Reconfigurable Smart Water Quality Monitoring System in IoT Environment", 978-1-5090-5507-4/17/$31.00 ©2017 IEEE ICIS 2017, May 24-26, 2017, Wuhan, China.

[3] AllulaRajini, P. RajendraChaitanya, "Implementation of RF Controlled Robotic Boat with Wireless Video Transmission to Remote Television Using Raspberry Pi", ISSN No: 2348-4845 International journal and Magazine of Engineering, Technology, Management and Research, A peer Reviewed Open Access International Journal Jan 2017.

[4] K. A. UnnikrishnaMenon, Divya P, Maneesha V. Ramesh, "Wireless Sensor Network for River Water Quality Monitoring in India",IEEE-20180 ICCCNT' 2012 July 26 - 28, 2012.

[5] Gregg Podnar, John M. Dolan, Kian Hsiang Low, Alberto Elfes, "Telesupervised Remote Surface Water Quality Sensing", IEEEAC paper#1617, Version 4, Updated 2010:01:05 2 978-1-4244-3888-4/10/$25.00 ©2010 IEEE .

[6] Peng Jiang, Hongbo Xia, Zhiye He and Zheming Wang, "Design of a Water Environment Monitoring System Based on Wireless Sensor Networks", ISSN 1424-8220 Sensors 2009, 9, 6411-6434; doi: 10.3390/s90806411.

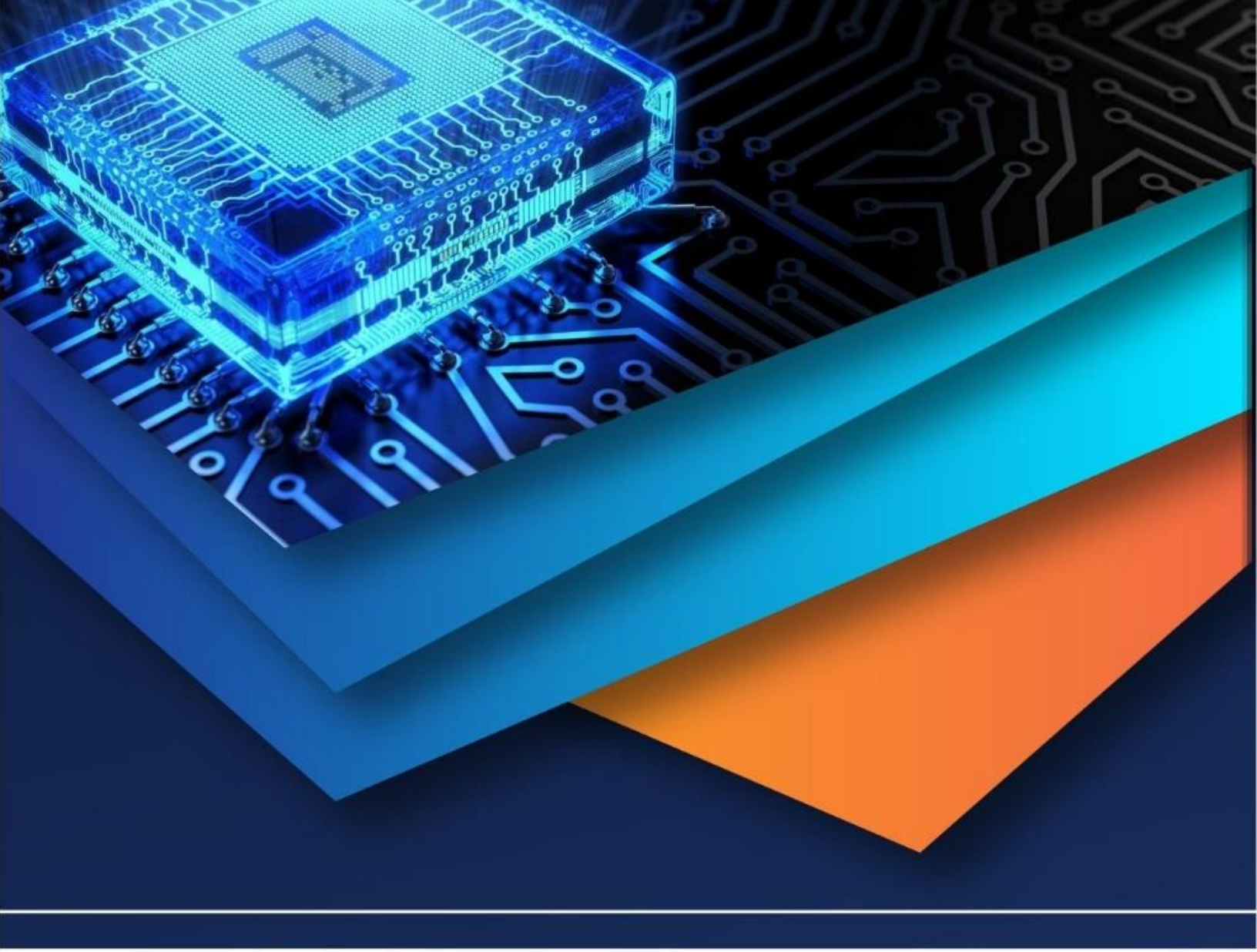
[7] R. Bachmayer, N. Ehrich Leonard, J. Graver, E. Fiorelli, P. Bhatta and D. Paley, "Underwater Gliders: Recent Developments and Future Applications" Invited Paper, National Research Council.

[8] Joshua G. Graver and Ralf Bachmayer and Naomi Ehrich Leonard, "Underwater Glider Model Parameter Identification", Proc. 13th Int. Symp. On Unmanned Untethered Submersible Technology (UUST), August 2003.

AUTHOR'S BIOGRAPHY

Aakash Pramod Adake is currently pursuing M. Tech 2nd year in Electronics and Telecommunication Engineering department from Kolhapur Institute and Technology College of Engineering (Autonomous), Kolhapur. He has published review paper in International Journal for Research in Applied Science & Engineering Technology, his main field of interest are embedded system, Wireless sensor networks, IoT, Automotive, RC hobby and mechatronics.

Prof. Dr. Mrs. Manasi Dixit is working as Professor in Department of Electronics Engineering, Kolhapur Institute and technology's College of Engineering (Autonomous), Kolhapur. Her teaching experience is 34 years. Her main fields of interest are Digital Signal Processing, Speech Processing, Image Processing and Microwave Engineering. 38 PG students have completed their research work and have been awarded M.E.(E&TC) degree under her guidance. She has published 42 papers in reputed international journals. She has worked in the capacity of the SENATE member Shivaji University, Kolhapur and BOS-Board of Studies Member for Electronics and Telecommunication Engineering, Shivaji University, Kolhapur.



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