
A Review Paper On Automatic Water Recycling Using Raspberry Pi

Prof. AmrutaNikam*, Madhuri Urgunde, PriyankaShinde*****

Department of electronics and telecommunication, Dr. DY Patil College of Engineering, Management & Research, SavitribaiPhule Pune University, Akurdi, Pune, India.

ABSTRACT:

Clean water is basic human need. Now a day's a secure drinking water supply is impossible without the use of the latest technology. In many locations, Innovative technologies for the treatment of drinking water as well as water reuse are gaining in importance in all the world's regions. Water Resources are depleting day by day in several localities and is constantly upgrading its expertise and innovating advance treatment. solutions especially in recycling of wastewater. Recycling and reuse of the existing water & wastewater is extremely important to protect our precious resources for domestic, agriculture, commercial and industries

Keywords—: *Raspberry Pi, Turbidity Sensor, Level Sensor.*

INTRODUCTION

Water is one of the most important natural resources and is of vital importance for all living things on the earth. Up to 60% of human body is water. Therefore quality of water we drink is very important. The drinking water should be clean. The drinking water should be pure and free of microorganisms and it should be treated and disinfected before consuming it. Water treatment takes the raw water from river, lake, reservoirs or other underground sources and provide safe and reliable drinking water to mankind. Automation is a key to water treatment plant management since it has various tangible and intangible benefits. This paper focuses on an innovative and intelligent control and monitoring system for automatic water recycling by using "Raspberry Pi". Raspberry Pi is a minicomputer which has an ability to control the system comes with advantages like low cost and compact size. Turbidity Sensor used for process control. Automation process involves monitoring and control of various sensors & motors. These sensors, actuators and motors can be skillfully controlled using Raspberry Pi. Graphical representation of entire water treatment process can be displayed on the LCD connected to Raspberry Pi. Graphical user interface can be designed with the help of programming languages like Python.

With the rapid growth of the thirt/providence, more and more serious troubles of environmentalise. Water defilement is one of these problems. Regular monitoring of water quality parameters are Conductivity, pH, turbidity.

BLOCK DIAGRAM

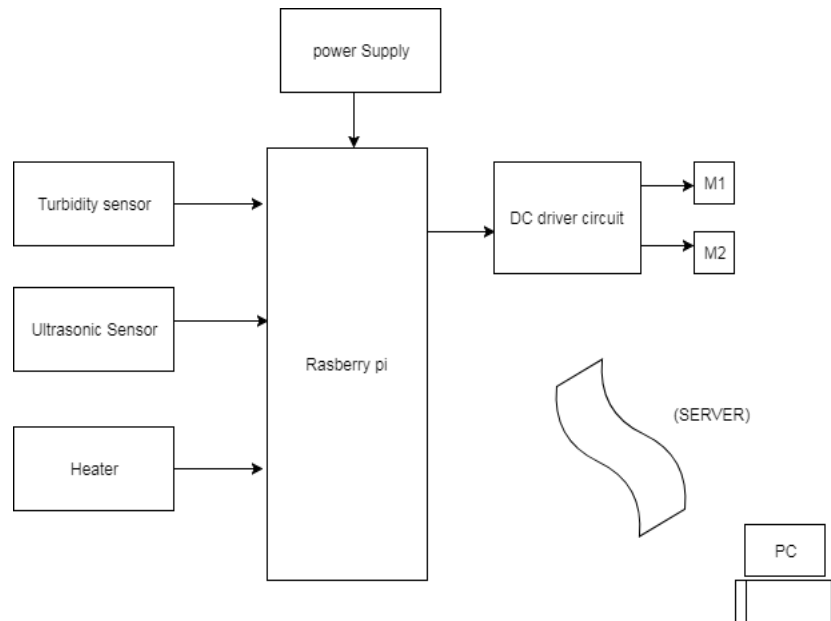


Fig. Automatic Water Recycling Using Raspberry Pi

LITERATURE SURVEY

1. Indranil Roy choudhury Vasyi Hafiychuk & Kai Goebel mentioned in their paper work on Automatic water Recycling Using Raspberry Pi that a water recycling system (WRS) deployed at NASA Ames Research Center's Sustainability Base (an energy efficient office building that integrates some novel technologies developed for space applications) will serve as a test bed for long duration testing of next generation spacecraft water recycling systems for future human spaceflight missions. This system cleans impure water and recycles it into clean water. Like all engineered systems, the WRS is prone to standard debasement due to regular use, as well as other faults. Diagnostic and predictive applications will be deployed on the WRS to ensure its safe, efficient, and correct operation. The diagnostic and predictive results can be used to enable condition-based maintenance to avoid unplanned outages, and perhaps extend the useful life of the WRS. Diagnosing involves detecting when an error occurs, isolating the root cause of the error, and identifying the extent of harm. Predictive involves predicting when the system will reach its end of life irrespective of whether an abnormal condition is present or not. Firstly we develop a physics model of both nominal and defective system behavior of the WRS. Then, we apply an integrated model-based diagnosis and prognosis framework to the simulation model of the WRS for several different fault scenarios to detect, isolate, and identify faults, and prognostic the end of life in each defective scenario, and present the experimental results.
2. Shuqin Bai & Gaowa Naren mentioned in their paper work on Automatic Water Recycling Using Raspberry Pi that to prevent the silica scale formation in the geothermal water recycling process, the silica acid perfectly removed from geothermal

water as calcium silicate by calcium nitrate. Ordered mesoporous silica was synthesized at strong acidic condition by using low cost calcium silicate as silicon source, which was separated from geothermal water recycling process.

Keywords-water recycling system; silica scales; remove; mesoporous silica; reclamation

PROPOSED WORK

To an almost operational level we have developed an application of high spectral and spatial resolution airborne remote sensing. This paper investigates the role of remote sensing especially coupled to the two other available water quality assessment tools: in situ measurements and ecological Water quality modelling data. Discussed about the transfer function between water quality and source of pollution. Implemented an automated water monitoring system for waste water. Author had developed a multi-sensor heterogeneous real time water monitoring system using the parameters like pH conductivity, and turbidity and dissolved oxygen Environmental water quality, also called ambient water quality. And it can be related to water bodies such as lakes, rivers, and oceans. Water quality standards for surface waters changes significantly due to different environmental conditions, ecosystems, and intended human uses. The venomous substances and high populations of certain microorganisms can present a health risk for non-drinking purposes such as irrigation, swimming, fishing, and rafting, boating, and industrial uses. These impure water may also affect wildlife, which use the water for drinking or as a home ground. Modern water quality laws generally specify protection of fisheries and recreational use and require, as a minimum, retention of current quality standards. The service security with moderate level was designed by GSM. The system was designed to authenticate the subscriber using a pre-shared key and challenge-response. Communications between the subscriber and the base station can be encrypted with the help of GSM board. Water pollution is the contamination of water bodies. Water pollution occurs when pollutants are discharged directly or indirectly into water bodies with less amount of treatment to remove harmful compounds. Water pollution affects plants and organisms living in these bodies of water. This effect is damaging not only to individual species and populations, but also to the natural communities. Water covers over 70% of the earth's surface and is a very important resource for people and the environment. Toxic water pollution affects drinking water, rivers, lakes and oceans all over the world. This consequently harms human health and the natural environment. Here you can find out more about water pollution and what you can do to prevent it. An estimated 700 million Indians have no access to a proper toilet. 1000 Indian children die due to diarrhoea sickness every day.

ADVANTAGES

This technology is nominated for efficient smart water recycling systems and it may provide a valuable tool for purification of water. Maximum sucking up of water by the plant is ensured by purifying water evenly using motor. So there is less impureness in water. This system also automated as we can control the amount of water we want deliver to the city when it is needed by the people. This project can be used to make water impure free where no manpower is needed. Many aspects of the system can be changed according to the need and controlled through Raspberry pi module.

CONCLUSION

- Raspberry pi based automation is a new and advance technology. Automation serves a vital role in the safe and reliable operation of a water treatment plant in providing pure drinking water. Raspberry Pi simplifies the process of automation and increases the efficiency of water. Use of raspberry pi dramatically reduces the price of the system.
- Water recycling is an effective response method to easing the water resource crisis. From viewpoint on reuse of water resource and reclamation of valuable elements in the water resources, this study presents the simple method.
- Monitoring of Turbidity, pH & conductivity of Water uses corresponding sensors. The system can monitor water quality automatically, and it up date to servers website with low cost and does not require people on duty. So the water quality testing has to be more economical, convenient and fast. The system has good flexibility by replacing the corresponding sensors and changing the relevant python programs. This system can be used to monitor other water quality parameters. The operation is simple. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on. It has widespread application and extension value.

REFERENCES

- i. Matt Richardson and Shawn Wallance, Getting Started with Raspberry Pi (USA, O'Reilly Media, 2012).
- ii. Eben Upton, Raspberry Pi user guide.
- iii. Maik Schmidt, Raspberry Pi – A quick-start guide.
- iv. BCM2835 ARM Peripherals, Broadcom, 2013.
- v. Brendan Horan, Practical Raspberry Pi.
- vi. United states Environmental Protection Agency, “The History of Drinking Water Treatment”, February 2000.