Retraction

Retraction: IoT Based Industrial Waste Water Monitoring and Recycling (J. Phys.: Conf. Ser. 1916 012119)

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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

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IoT Based Industrial Waste Water Monitoring and Recycling

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Abstract. In this rapidly urbanising country, environmental safety management has recently become the most challenging challenge. Waste water management is a way to treat waste that is reasonably reused and does not belong to the trash. Reducing and recycling is one of the most efficient ways to handle waste. Waste water treatment firms have been dealing with a slew of issues for decades based on how to prevent waste being managed. Separating wastes that are discarded in the water, such as paints and battery wastes, is difficult, because they need a special method to classify and recycle. To address these issues, we turned to the Internet of Things (IoT) for a waste managing system. It is simple to detect polluted mixed in water using IoT, which can be indicated to the consumer and recycled. In this way they can be made harmless and is again used. This concept's utility is illustrated in the article.

1. Introduction
Pollution can be avoided by removing discarded chemical or other hazardous materials from dumping sites. The method of extracting materials from there is both expensive and risky, since there is no way to distinguish between the different types of waste and the potential harm they can cause; in most cases, these processes can only be carried out by humans. Many waste management and recycling firms have tried their hardest to reduce the cost of collection and recycling, but they have been unsuccessful. Resource recovery entails the separation of waste materials, which is a labour-intensive process. In order to achieve sustainable waste management, businesses have used questioning and surveys to analyse source separation intentions and willingness to pay for better waste management facilities. Some studies have looked at proenvironmental behaviour by projecting an individual's intent using theories like the Theory of Planned Action, Norm-Activation Theory, and Value Belief Theory. Theoretically, collecting enough data on recycled items would lead to better recycling behaviour. Anyway, since it is focused on the collection of data through data analysis, this method can be subjective. It would be perfect if there was a system in place that could predict recycling trends at the point of disposal. Waste management organisations can monitor violations and recycling actions in real time this way. In this paper, it is trying to detect the type of water that are being dumped in the water bodies such as the lake, ponds, rivers etc. This is being worked by means of Internet of Things that is being connected to the server every time when the water is being pumped out of the industry the sensors like turbidity, temperature and pH sensor reads the water value and feed them to
When they are above the fixed value then they are being redirected to the recycling pit once again. This process is being continued till they met the fixed point of the sensors. Every time they are in to the recycling process the user is being given a notification. This process helps the prevention of waste water that is being dumped into the water bodies. Collecting violations in real time will assist waste management firms and environmental protection agencies in conserving capital and assessing perceived disposal costs.

2. System Overview
Waste water recycling and reuse practices in Mediterranean basin was practiced since the ancient Greek and roman civilization. Raw or partially waste water has been used in many places around the world, with significant public health and environmental consequences. The recycled water is further used for domestic purposes. The process water has to be purified before it can be discharged into the sewage system or into natural waters. The water recycled will be helpful to increase the ground water level and it will be helpful to people to reuse the water. The recycled water can be used for vehicles washing gardening and for washing floors, kitchen and also useful for agriculture. It improves the ground water level and should save water for future use without contaminating the water [1].

2.1. Filtering Tank
Filtering tank (see Figure 1) is an iron storage tank which is used to filter the waste industrial water. The pebbles are placed at the bottom of the tank which is used to filtrate the water at maximum level and the sponge will be placed at the top of the pebbles bed which destroys the 50% of salt content in the waste water. Smart water quality monitoring system focused on the Internet of Things that aids in the continuous measurement of readings of water conditions. They are divided into four categories based on the physical properties of water (pH, electrical conductivity, temperature, and turbidity) [2]. The sensors are connected to the node MCU in a precise manner to detect water quality, and the data collected from the sensors is transmitted to a NET platform framework that compares the readings to WHO standard values. The proposed method will assess the water quality for reusing and drinking based on the calculated results. Field sampling and subsequent use for remote operations. This type of remote monitoring device must be able to withstand extreme temperatures ranging from -45 degrees to 30 degrees. It must function without connection to the power grid and with minimal communication. It can house electrochemical, optical, physical, and radiation sensor modules that measure microbiological stability, nutrients, and salt levels, for example. The presence of radioactivity in treated industrial waste water, as well as its clarity.
2.2. Mollusk sand filtering process

The concentration of Pb, the degree of flexibility, and pH increased after the substances or substances in the wastewater passed through a filtered tube made of active coconut shell granules, mollusk sand, and beads. The tube measures 120 cm long and is made of 10 cm of stone, 20 cm of mollusk sand, and 10 cm of active carbon granules. The function of the sand platform is generally, and the mollusk filter, which is 20 cm thick in particular, filters and reduces heat. Excess moisture contained in contaminated water is caused by dust particles such as lead particles, bird droppings, and micro-organisms, or is usually determined by pollutants in a particular area or city [3]. Contaminants such as dust, metals such as Pb, and non-metallic materials
such as bacteria, viruses, and the color of contaminated water will be successfully filtered through a mollusk sand medium filter tube, which will form a film layer. The mollusk sand sand filter works best in lowering Pb levels. In contrast to conventional sand and active carbon, wastewater treatment uses quartz sand as an improved filter to improve the pH by 4.7 percent in treatment water from rivers and 2.9 percent in wastewater, while mollusk san has increased the pH by 26 percent. Mollusk shell sand (see Figure 2) has a better ability to increase the pH of contaminated water, due to the calcium oxide (CaO) content of 94.1 percent, sodium oxide (Na2O) of 1%, and silicon oxide (SiO) of 1% in mollusk sand. Mollusk sand has the ability to absorb heavy metals from the water and to hold suspended objects, making it an ideal water filter. Shell is one of the world's largest carbon-rich mineral resources. The mineral content of the shell varies and is high; for example, calcium makes up 66.7 percent, magnesium makes up 22.28 percent, and SiO2 makes up 7.88 percent. This is why minerals containing naturally rotten shells or sediments can raise the pH of contaminated water and carbonate can lead to lead

2.3. Active Carbon Filtering

Dirty water is not always a good source of clean, healthy drinking water; it has no color, taste, and clarity. The area where the waste falls has an impact on wastewater. Wastewater in rural areas can be contaminated by landfills, pesticides, and animal waste, while urban wastewater can be polluted by chemicals dissolved in tasteless, colorless, and invisible. Lead (Pb) was used for roofing, paint, tin, tar, dust, and asbestos, among other things. Volcanic eruptions and gas emissions from automotive and industrial fuels can also cause Pb [4]. Polluted water pollution can be caused by microorganisms such as bacteria, viruses and parasites, in addition to chemical substances. The level of air energy, especially in polluted water, can be caused by suspended inorganic and inanimate matter, as well as air pollutants such as germs, germs and parasites. To reduce or remove airborne contaminants in polluted water, use mollusk sand filters and active carbon dioxide from coconut shells. Sewage filtration is done by moving the wastewater through an inlet to extract particles that cannot be separated from the sediment. The suction process can be used to deal with contaminants that avoid filtering in wastewater treatment. As a result, it was found that a filtration process involving mollusk sand and carbon dioxide absorption was effective in reducing wastewater inefficiency, with a typical 20 NTU pre-treatment and 5.67 NTU post-treatment, meeting 72 percent of water requirements. The wastewater treatment system helps to prevent suspended chemicals and chemicals escaped from the filtering process from escaping, which is why this process works to reduce contaminants in contaminated water such as lead (Pb) concentration of wastewater that does not meet water needs has improved and is now meeting drinking water requirements. Pb in contaminated water does not follow water quality, with moderate filtration of Pb in contaminated water 131.7 g / l before treatment and 0.69 g / l after treatment [5]. Effective carbon capacity to absorb Pb in wastewater is due to active carbon content large micro-pore and meso pore volume, which makes it very easy to absorb pollutants (including Pb) in sufficient quantities. Absorbing structure consisting of a free amorphous carbon atom made up of free carbon and has a deep surface that allows it to absorb many. Using a filtration method that incorporates mollusk sand and active carbon infiltration to reduce Pb concentration, turbidity, and increase the pH of wastewater. The findings show a 99.47 percent decrease in Pb performance, a 72 percent increase in turbidity, and a 26 percent increase in pH performance, with a mean of 5.16 before treatment and 6.95 post-treatment. The concentration of Pb was reduced to 0.69 g / l after the process, the turbidity was reduced to 5.6 NTU, and the pH was increased to 6.95. The concentration of Pb was 10 g / l, the turbidity was 5 NTU, and the pH was 6.5-8.5, meeting the water quality process.
2.4. Process flow

In developing countries like India, the growth of industry occurs at a rapid pace, resulting in a slew of drawbacks. The main area affected is the water bodies, as all industries need a large amount of water. These waters are pumped back into the river without any consideration or recycling. The overall process of the proposed method is shown in Figure 3.

![Figure 3. Overall process flow of proposed approach](image)

The proposed approach comes into play at this stage. The project’s main goal is to prevent the world from being ruined. Another crucial aspect is to have cost-effective recycling and reuse options. The consumer can easily identify the process. This project is used to automate the checking of the water that is being dumped in the water bodies by the use of Internet of Things (IoT). In this method, the water that is being pumped out from the factory is being directly dumped into the filtration tank. The output from the tank is being checked by using three sensors: temperature, turbidity, and pH sensors. If the sensors detect anything that is above the fixed value, then the user is being indicated, and the water is then once again sent for recycling. This process is being continued until they reach the required level. Then they are being sent out and can be reused again in the factory or household purposes. Every value of the sensors can be fed directly into the server, and they can be noted and alerted from anywhere in the world.

3. Results and Discussion

Experimental setup was done using different sensors and the sensor data are periodically updated in the IoT cloud for live monitoring. Figure 4 shows the sensor readings obtained in the IoT cloud. Here Thing Speak cloud webpage is used to directly feed the sensor data. The sensor reading that are shown in Figure 4(a)-(c) are the temperature, turbidity, and pH respectively. From the results shown in Figure 5, it is inferred that whenever the sensor readings go beyond the threshold, it will turn ON the motor for further recycling process and the valve is automatically closed. Thus, the imperfect recycled water will be avoided and the atmosphere pollution can be eliminated.
Figure 4. Sensor reading-(a) Temperature reading (b) pH reading (c) Turbidity reading

Figure 5. GSM (a) Output Message (b) Again recycling message

Figure 5 shows that the messages that are sent by the GSM module. The user gets the first message (see Figure 5(a)) when the sensor value is less than the fixed value. When the user is receiving the message shown in Figure 5(b), it is inferred that the water does not satisfy the sensor value and so the water will send back to the filtering tank.

4. Conclusion
The most cost-effective and simple method of recycling and reusing is IoT-based industrial waste water monitoring and recycling. Since they are live feed in to the server, this approach can be seen from anywhere in the world. This approach has the potential to make significant improvements in the water system and provide everybody with a safe living environment.

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