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Impact of Pollution on Open Water Bodies in the Context of Artificial Intelligence

Vijayakumar Adaickalam[1],Murugan R[2],Chitaranjan Dalai[3]
1.Professor, School of Computer Science and Information Technology,
Jain Deemed to be University, Bangalore, India.
2.Associate Professor, School of Computer Science and Information Technology,
Jain Deemed to be University, Bangalore, India.
3.Assistant Professor, Department of Civil Engineering,
Odisha University of Technology and Research, Bhubaneswar-751003, Odisha, India.
Correspondence e-mail:vijay.pattukottai@gmail.com[1]

ABSTRACT

As there is an increasing factor of pollution in the environment and ecological water bodies, therefore, the treatment of this water has gained a lot of importance in the past few years. Many scientists proposed models for effective treatments that also are working in the present day but there is still a lot of space been left to reach its optimum value. Therefore, in our paper, we proposed artificial intelligence techniques to control the treatment process through automation and iteratively running algorithms. This method also has an impact on a better life and economic growth ultimately. First, we will be creating the corresponding sensing module for the environment in which the water body lies then we will calculate the various factors like water temperature, turbidity of the water, dissolved oxygen content in water also the temp of the environment, and its humidity. Then we will be creating the time-variation dynamic model to predict the water quality to the maximum accuracy and by doing this we will be ultimately able to develop the Quality prediction model for water. For this purpose, we will be using the Convolutional Neural Network (CNN) Algorithm model for collecting the data analyzing it and optimizing the quality evaluation model for precision in our calculations. This has been tested by putting the model in the specific river for some time than predicting and evaluating the quality of water. The results showed that the absolute error in dissolved oxygen amount was 0.97% while in the calculation of the dissolved amount of phosphorus the absolute error was less than 2.27%. These results show that using artificial intelligence-based algorithms in the governance of ecological water can be very helpful for predicting and evaluating more accurate calculations and results and thus results in better economic growth.

Keywords: *Pollution, Open Water Bodies, Artificial intelligence, Convolutional Neural Network (CNN), Water Quality Prediction.*

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INTRODUCTION

The world is moving towards productive competition and the era of industrialization is causing adverse effects on the aquatic environment. Domestic pollution and industrial sewage combine to form a bouncing effect on the severity of the overall pollution. The current methods that are being used presently are not enough to serve the issue and in fact, they are also causing danger to the aquatic life and leading towards an unbalanced echo system. This is also unacceptable for the sustainable growth of the economy. Therefore scientific methods and artificial intelligence-based algorithms have to play their part in governing the efficiency of the water environment

The main purpose of this article is to emphasize better governance of water treatments supporting the growth of a green environment and also the economic growth. All these parameters are taken care of in this paper in depth. Murder in his research told about the impact of green structures and plants in the removal of suspended solids, toxic metals, pathogens, phosphorus content and also threw light on significant pollutants in urban rainwater rather he did not propose the direct method for the treatment of the water. In this perspective, Hashimoto did research and proposed that titanium dioxide (TiO2) has a good effect on the degradation of pesticides in the water. These two and many others proposed several ideas but these experiments were found to be increasing economic costs with great time requirements.

MATERIAL AND METHODS

Urban streams and rivers were always the recipients of untreated wastewater from many sources containing various types of home, agricultural, including industry foreign substances. The scents generated by these CIwaterbodies were damaging to the λ environment; nonetheless, the release is often n unavoidable owing to natural processes is represented in equation (1)

$$CI = \frac{\lambda\, max - n}{n - 1} \qquad (1)$$

Municipal sewage is a mixture of numerous organic materials, and also the destruction of these materials produces hazardous gases, which impair the atmosphere and, therefore, cause disease infections. The people in this CRsewage condition are expected to leave their homes because they CIconfront filthy potable, skin and respiratory contagious diseases, and so the RIurban environment circumstance became more frightening.

$$CR = \frac{CI}{RI} \qquad (2)$$

If treated wastewater is dumped $(x - l)(m - l)$straight into urban bodies of water or streams with no sanitary pretreatment process, it's really the primary source of environmental harm. Furthermore, due to a rise in the$(k - x)(k - m)$ scarcity of safe drinking water, it is in need of efficient management of readily available water. Controlling environmental degradation will be a big challenge for planners and policymakers due to treatment costs and unfettered population growth.

$$\mu(\alpha) = \begin{cases} (x - l)(m - l) & l \le x \le m \\ (k - x)(k - m) & m \le x \le k \\ 0, & otherwise \end{cases} \qquad (3)$$

In this case, we w_i^srequire a technology that quickly resolves those significant pollution issues while also being able to ijhave been used to rehabilitation existing systems. Some $w_{ij}^s w_j^{\alpha}$traditional technologies and procedures have been created and applied throughout the last few decades.

$$w_i^s = \sum_{j=1}^{j=m} w_{ij}^s w_j^{\alpha} \qquad i = 1,2,\ldots\ldots,n \qquad (4)$$

RESULTS AND DISCUSSIONS

To initiate the implementation of reiteration (conventional technique), a series and rectangular weir were utilised to move the waste discharge and just a local produce a significant was being used to pump air into to the body of water for treating wastewater.

Figure 1: Performance Analysis Artificial Intelligence based Detection of Pollution Impacts on Open Water bodies

The Multifunctional Artificial Wetland has already been utilised for treated wastewater and stream purifying water. Nitrogen and other fertilizer wastes (show in figure 1) just a major cause of pollution throughout China, and traditional methods were inadequate to system restore.As a result, research on atmospheric ammonification is progressing toward a full-scale water treatment facility. Using civilization molecular approaches, at least 5 genera and 13 species have already been described thus far. Some specialized reactor systems, including such sequential batch nuclear plants, spinning biological contactors, trickling filters, UBF reactor designs, sludge drying bed reactors, and membrane bioreactors, have already been tried to introduce through both research facility and large scale to achieve high removal efficiencies, and we have finally discovered that these reactor designs played a significant role in

securing higher percentage performance for such good or service of nitrogen removal. Nitrogen contamination produces major environmental difficulties, threatening not only the long-term growth of fisheries, agriculture, tourists, and etc, and also the home situation of humans.

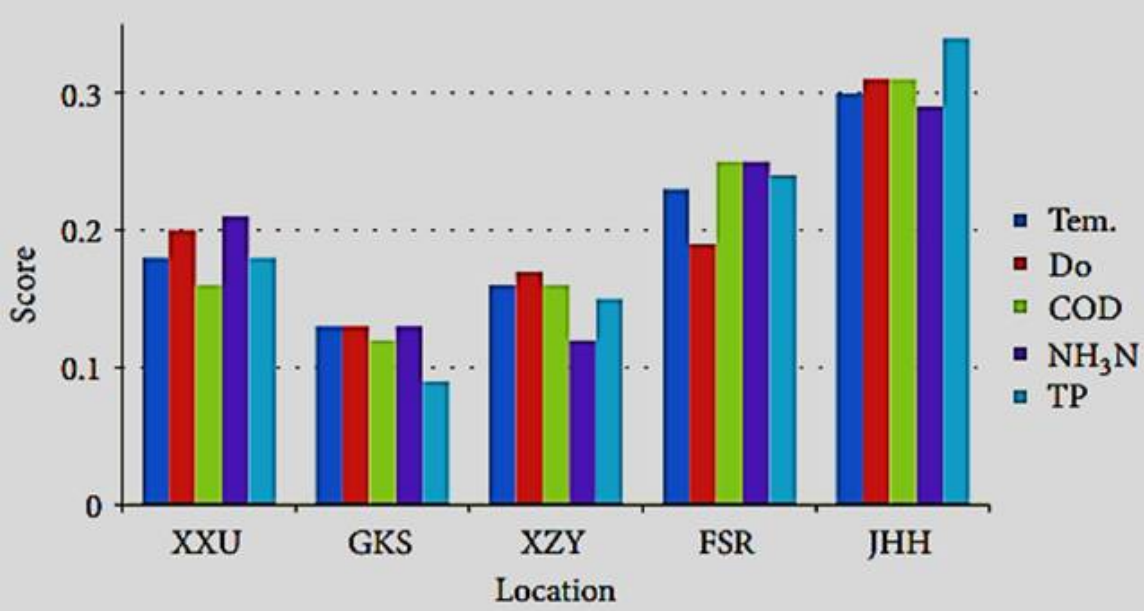

Figure 2: Criteria for Ranking Every Groundwater Quality Measure in Each Site using CNN Algorithm

The concentrations of phosphate and nitrogen in home wastewater ranged between 10 to 17 mg/L but also 30 to 50 mg/L, correspondingly.Because of public, financial, and legislative pressure, ecofriendly and strategy involves demand seems to be a popular and outstanding topic. The optimal choice in a complicated framework is dependent on the program's extraction efficiency (refer Figure 2), nitrogen removal stability, including microbial degradation of colloidal matter. In this circumstance, the primary priority is to use any technology that is more dependable in terms of power consumption, chemical transformation to biomass, sophisticated infrastructure, and system repair or maintenance costs. Bacterial Technology (BT) offers numerous options for treating various these conditions.BT is a biomonitoring technology that employs microbial metabolism that eliminate nutrients form bodies of water and restore them to their original condition, and also its operating costs are quite low, making it of significant public significance. It is famous in the investigation fields such as environmental physics and technology due to it's own advanced and reliable. The primary worry that is immediately important in the process for substance breakdown is temperature. Because of these factors, we may confidently use the new method as BT. These microorganisms are typically contracted to convert pollutants or minerals into simple or harmless entities and create appropriate effluents. Since previously noted, this technology provides comforting benefits over other conventional techniques.BT has already been effectively used to rehabilitate dirty lakes, restore polluted waterways, and digest water treatment plant effluent. BT is being used in various regions in China to reduce urban pollution of rivers, that is, to treating contaminated urban bodies of water. When compared to other conventional methods, it was proven to be successful having consistent results in accelerating the restoration of all bodies of water.

CONCLUSION

The task of environmental water management cannot be finished in a single day. It must be done from three perspectives: external pollution sources must be controlled, environmental conditions must be controlled and changed, and aberrant algae growth must be controlled. The analysis of data of source water factor data is specifically correlated to the treatment effect in the treatment process. The Data is current and accurate aids in making rational and scientific decisions. The sensor developed in this work is capable of collecting useful data and providing rapid feedback, as well as supplying experimental evidence for water quality forecast and evaluation models. To make scientific decisions, increase water environment protection efficiency, and save labor and equipment resources, accurately predict and assess data relevant to the source water.The design of the water environment detector in this study is too simple to examine the problem of power usage and damage in the course of use due to a lack of time and knowledge. This study only anticipated the amount of dissolved oxygen and phosphorus in the water while developing the prediction model, however, the structure of the components in the water is varied, and predicting these two alone is inappropriate. We will forecast as many indicators of water quality as conceivable in the next phase of the investigation.

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CONFLICT OF INTEREST
The authors declare that there is no conflict of interest for this study

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