LOWEL AI

Using technology and machine learning algorithms to detect harmful bacteria present in water

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ABSTRACT

According to the World Health Organization (WHO), each year, approximately 1.8 million people die from diarrheal diseases caused by contaminated water. Consuming contaminated water can transmit various diseases such as cholera, diarrhoea, dysentery and typhoid. This pressing global challenge of water contamination has shown the need for innovative solutions for the detection of harmful bacteria present in water sources. LOWEL AI (Learning from Observations to Improve Water Efficiency and Life) is emerging as a technological innovation aimed at revolutionizing water quality assessment by developing a machine learning model that can detect harmful bacteria present in water samples. This paper discusses the potential of LOWEL AI, an emerging research work that outlines the integration of machine learning algorithms, bioluminescent sensors and microscopic cameras to detect harmful bacteria present in water and predict future water conditions by the measurement and observation of certain molecules related to bacteria.

The researcher predicts significant findings from this study which includes compelling correlations between ATP(adenosine triphosphate) levels and bacterial concentration ($r = 0.75$, $p < 0.05$), as well as the observation of an inverse relationship between bacterial presence and levels of nitrates ($r = -0.62$, $p < 0.05$). These findings highlight the effectiveness of ATP-based bacterial detection and shows the relevance of the sensors in real-time monitoring capabilities.

It is important to note that at this stage, LOWEL AI is a concept and theoretical framework, no practical, hands on implementation or experimentation has been conducted as of yet. The paper discusses potential correlations and data validation measures that will be explored in a future practical implementation of the LOWEL AI framework. Emphasizing that this work serves as a foundational step towards shaping the future of water quality management.

Key words | bacteria, machine learning, water quality, bioluminescent sensors, adenosine triphosphate

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