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IoT-Based Water Monitoring Systems: A Systematic Review

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Abstract

Water quality monitoring plays a significant part in the transition towards intelligent and smart agriculture and provides an easy transition to automated monitoring of crucial components of human daily needs as new technologies are continuously developed and adopted in agricultural and human daily life (water). For the monitoring and management of water quality, this effort, however, requires reliable models with accurate and thorough datasets. Analyzing water quality monitoring models by utilizing sensors that gather water properties during live experiments is possible due to the necessity for precision in modeling. To convey numerous conclusions regarding the concerns, issues, difficulties, and research gaps that have existed throughout the past five years (2018–2022), this review article thoroughly examines the water quality literature. To find trustworthy peer-reviewed publications, several digital databases were searched and examined, including IEEE Xplore®, ScienceDirect, Scopus, and Web of Science. Only 50 articles out of the 946 papers obtained, were used in the study of the water quality monitoring research area. There are more rules for article inclusion in the second stage of the filtration process. Utilizing a real-time data acquisition system, the criteria for inclusion for the second phase of filtration looked at the implementation of water quality monitoring and characterization procedures. Reviews and experimental studies comprised most of the articles, which were divided into three categories. To organize the literature into articles with similar types of experimental conditions, a taxonomy of the three literature was created. Topics for recommendations are also provided to facilitate and speed up the pace of advancement in this field of study. By conducting a thorough analysis of the earlier suggested methodologies, research gaps are made clear. The investigation largely pointed out the problems in the accuracy of the models, the development of data-gathering systems, and the types of data used in the proposed frameworks. Finally, by examining critical topics required for the development of this research area, research directions toward smart water quality are presented.

Author Keywords

internet of things; systematic review; water quality monitoring

Index Keywords

Agriculture, Data acquisition, Internet of things, Water filtration, Water management; Automated monitoring, Daily lives, Management of water qualities, Monitoring and management, Research areas, Research gaps, Smart agricultures, Systematic Review, Water monitoring systems, Water quality monitoring; Water quality; data acquisition, filtration, Internet, literature review, monitoring system, precision agriculture, taxonomy, water quality

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