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Intelligent Technology for Real-Time Monitor and Data Analysis of the Aquaculture Toxic Water Concentration

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Abstract : The situation of a group of fish die is frequently found due to the fish disease caused by the deterioration of aquaculture water quality. The toxic ammonia is produced by animals as a byproduct of protein. The system is designed by the smart sensor technology and developed by the mathematical model to monitor the water parameters 24 hours a day and predict the relationship among twelve water quality parameters for monitoring the water quality in aquaculture. All data measured are stored in cloud server. In productive ponds, the daytime pH may be high enough to be lethal to the fish. The sudden change of the aquaculture conditions often results in the increase of PH value of water, lack of oxygen dissolving content, water quality deterioration and yield reduction. From the real measurement, the system can send the message to user's smartphone successfully on the bad conditions of water quality. From the data comparisons between measurement and model simulation in fish aquaculture site, the difference of parameters is less than 2% and the correlation coefficient is at least 98.34%. The solubility rate of oxygen decreases exponentially with the elevation of water temperature. The correlation coefficient is 98.98%.

Keywords : aquaculture, sensor, ammonia, dissolved oxygen
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