

Real-time monitoring of water quality using temporal trajectory of live fish

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Abstract

This paper proposes a real-time water quality monitoring scheme, which is based on judging time-series motion trajectories of live fish acquired by a CCD camera. The proposed scheme includes a floating-grid method to extract patterns in the motion trajectories and a neural network mechanism to quickly determine the frequency of pattern changes in these trajectories. To validate the proposed methods, several experiments were conducted by changing pH values of the water that houses live fish. The experimental results showed that the proposed methods could effectively differentiate motion trajectories of the fish in an efficient manner. The proposed scheme could be employed as a precautionary warning system for aquatic farms, drinking water treatment plants, and other related industries.

Keyword : Temporal trajectory, Trajectory representations, Water quality monitoring, Neural network