

ABSTRACT

In aquaculture, poor water quality affects fish growth and mortality. Water quality parameters such as ammonia, temperature, pH, and dissolved oxygen must be thus controlled and monitored. Measuring devices for dissolved oxygen and ammonia levels are available, but measurements cost is not suitable for small-scale aquaculture and are manually processed. This experimental study proposes the Emerson formula to navigate the estimated value of unionized ammonia and the Benson-Krause formula to navigate the estimated dissolved oxygen solubility value without using an ammonia sensor or dissolved oxygen sensor. Internet of things (IoT) is applicable for aquaculture to monitor and collect water parameter data without human intervention. The values of both estimates are validated by applying the Seneye Sensor. RMSE and MAE are implemented to calculate the performance evaluation between the Seneye value and the estimated value. Fuzzy logic classify water quality is derived from the estimations of unionized ammonia and estimates of dissolved oxygen as input.

Keywords: Internet of Things, Water quality, Fuzzy logic, Dissolved Oxygen