

Artificial neural network models for wastewater treatment plant

Abstract

In water treatment plant decision support systems, the study of the treatment problem(s), information acquisition and representation, and the assessment and evaluation of parameters guiding the selection of optimal treatment systems are all critical. Water treatment plants have been an essential feature of the National Integrated Water Resources Management Strategy (NIWRMP), which is consistent with the 10th Malaysia Plan's National Transformation Programme (NTP). Thus, it is appropriate to focus on the water treatment management. This research aims to develop models for Wastewater Treatment Plant (WWTP) via artificial neural network (ANN). The dataset is secondary data obtained from UCI Machine Learning repository system, which originally aims to characterize the plant's operating condition to forecast faults using the plant's statevariables at each point of the treatment phase. The data were derived from regular sensor readings at a city wastewater treatment facility. Four models were eventually developed using multilayer perceptron (MLP) neural network. The models are: (i) globalperformance input biological demand of oxygen, (ii) global performance input chemical demand of oxygen, (iii) global performance input suspended solids, and (iv) global performance input sediments. The models' performances were evaluated using Sum of Square Error (SSE). Policymakers may then use the suggested awareness model to enhance water quality evaluation control. It provides insight into the public's understanding of treated water quality care in their neighbourhood and thus, helping decision-makers to appreciate better whether people may or may not be aware of the importance of conducting water quality treatment. This research is in accordance with SDG 6 - Clean Water and Sanitation - of global Sustainable Development Goals (SDGs).