عنوان مقاله:

Predictive Performance Modeling of Habesha Brewery’s Wastewater Treatment Plant Using Artificial Neural Networks

محل انتشار:

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خلاصه مقاله:

Recently, process control is, mostly, accomplished through examining the quality of the product water and adjusting the processes through an operator’s experience. This practice is inefficient, costly and slow in control response. A better control of WTPs can be achieved by developing a robust mathematical tool for predicting the performance. Owing to their high accuracy and quite promising application in the field of engineering, Artificial Neural Networks (ANNs) are getting attention in the predictive performance modeling of WTPs. This paper focus on applying ANN with a feed-forward, back propagation learning paradigm to predict the effluent water quality of Habesha Brewery’s WTP. About 11 months of data (from May 2016 to March 2017) of influent and effluent water quality were used to build, train and evaluate the models. The study signifies that ANN can predict the effluent water quality parameters with a correlation coefficient (R) between the observed and predicted output variables reaching up to 0.969. Model architecture of 3-21-3 for pH and TN and 1-76-1 for COD were selected as optimum topology for predicting the performance of Habesha Brewery’s WTP. The linear correlation between predicted outputs and target outputs for the optimal model architectures described above are 0.9201 and 0.9692, respectively

کلمات کلیدی:

Artificial Neural Network, Wastewater Treatment Plant, Performance Modeling