



Activated sludge process modelling using selected machine learning techniques

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ABSTRACT

An approach to forecast the mixed liquor suspended solids (MLSS) and food-to-mass ratio (F/M) of the activated sludge in bioreactor using some methods of statistical modelling has been proposed. The impact of explanatory variables used in the models on the exactness of the models developed has also been analyzed. Those variables are wastewater quality indicators and parameters of activated sludge chambers while the modelling methods used are the support vectors machines, cascade neural networks and boosted trees. Moreover, the possibility of modelling those variables based on the measurements of wastewater flow and temperature in the wastewater inflow to the wastewater treatment plant has been investigated. It was concluded that the MLSS as well as the F/M could be successfully forecasted by variety of statistical models in which the wastewater quality indicators are not measured but modelled. The method is very useful operationally because it makes possible to monitor and correct the values of MLSS and F/M quickly and efficiently while only a limited access to the wastewater quality measurements is available.

Keywords: Wastewater treatment plant; Food-to-mass ratio; Mixed liquor suspended solids; Cascade neural network; Support vector machines; Boosted trees

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