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A comparative study of clonal selection algorithm for effluent removal forecasting in septic sludge treatment plant

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Abstract

The development of effluent removal prediction is crucial in providing a planning tool necessary for the future development and the construction of a septic sludge treatment plant (SSTP), especially in the developing countries. In order to investigate the expected functionality of the required standard, the prediction of the effluent quality, namely biological oxygen demand, chemical oxygen demand and total suspended solid of an SSTP was modelled using an artificial intelligence approach. In this paper, we adopt the clonal selection algorithm (CSA) to set up a prediction model, with a well-established method - namely the least-square support vector machine (LS-SVM) as a baseline model. The test results of the case study showed that the prediction of the CSA-based SSTP model worked well and provided model performance as satisfactory as the LS-SVM model. The CSA approach shows that fewer control and training parameters are required for model simulation as compared with the LS-SVM approach. The ability of a CSA approach in resolving limited data samples, nonlinear sample function and multidimensional pattern recognition makes it a powerful tool in modelling the prediction of effluent removals in an SSTP.

Keywords

Author Keywords: [biological oxygen demand](#); [chemical oxygen demand](#); [clonal selection algorithm](#); [least-square support vector machine](#); [septic sludge treatment plant](#); [total suspended solids](#)

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