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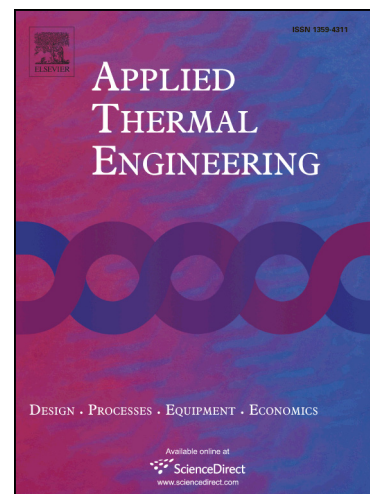
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Computational Intelligent Strategies to Predict Energy Conservation Benefits in Excess Air Controlled Gas-Fired Systems

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Abstract

Gas-fired systems and boilers are the noteworthy energy consumers in industries for energy production. The mostly applied factor in systems which contain boilers is the combustion efficiency. This parameter has widely applied to determine important information about exhaust gas such as CO_2 and O_2 . This study plays importance on applying the predictive techniques based on the Adaptive Neuro-Fuzzy Inference System (ANFIS), Multi-Layer Perceptron Artificial Neural Network (MLPANN), Support Vector Machine (SVM), and simple correlation for predicting the combustion efficiency of natural gas at extensive range of excess air fraction and stack temperature rise. The developed tools can be of great assessment for engineers dealing with combustion to have a rapid check on combustion efficiency of natural gas at broad range of applications without the requirement of any unit as pilot plant. The Levenberg–Marquardt algorithm is employed to optimize the bias and weight values of the ANN model. In addition,

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