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Intelligent forecasting of residential heating demand for the District Heating System based on the monthly overall natural gas consumption.

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Resumen: In this study, the residential heating demand of a case study (Baharestan town, Karaj) in Iran was forecasted based on the monthly natural gas consumption data and monthly average of the ambient temperature. Three various methods containing Extreme Learning Machine (ELM), artificial neural networks (ANNs) and genetic programming (GP) were employed to forecast residential heating demand of the case study and the results of these methods were compared after validating via real data. Actually, the main goal of the current study is to obtain the most accurate technique among these 3 common methods in this context. Validation of the forecasting results reveals that the important progress can be achieved in terms of accuracy by the ELM method in comparison with ANN and GP. Moreover, obtained results indicate that developed ELM models can be used with confidence for further work on formulating novel model predictive strategy for residential heating demand for the DHS. The outputs reveal that the new procedure can have a suitable performance in major cases and can be learned more rapid compare with other common learning algorithms. [ABSTRACT FROM AUTHOR]

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