

Feature selection and evolutionary rule learning for Big Data in smart building energy management

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Abstract In this paper we present an evolutionary computation based approach, namely a genetic fuzzy system, to build scalable and interpretable knowledge bases for predicting energy consumption in smart buildings. For accomplishing this task, we propose a cognitive computation system for multi-step prediction based on S-FRULER, a state-of-the-art scalable distributed genetic fuzzy system, coupled with a feature subset selection method to automatically select the most relevant features for different time steps. S-FRULER is able to learn a fuzzy rule-based system made up of Takagi-Sugeno-Kang (TSK) rules that are able to predict the output values using both linguistic imprecise knowledge (represented by fuzzy sets) and fuzzy inference. Experiments with real data on two different problems related with the energy management revealed an average improvement of 6% on accuracy with respect to S-FRULER without feature selection, and with knowledge bases with a lower number of variables.

Palabras

chave Regression methods for Big Data, Feature Selection, Fuzzy TSK Rules

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