Hybrid least squares support vector machines for short term predictive analysis

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ABSTRACT
Moth-flame Optimization (MFO) algorithm is a relatively new optimization algorithm which is classified as Swarm Intelligence (SI). It is inspired by unique behavior of moths in nature. Despite its young age, this algorithm has been proven to be able to address many optimization problems. With respect to that matter, this work introduces a new hybrid approach of MFO with Least Squares Support Vector Machines (termed as MFO-LSSVM). With such hybridization, the LSSVM hyper-parameters are fine-tuned by the MFO. Hence, the generalization in prediction can be improved. Realized in load data, the efficiency of the proposed model is compared against three comparable hybrid algorithms and measured based on three statistical criteria. An experimental study demonstrate that the MFO-LSSVM is able to produce better prediction results compared to the identified hybrid algorithms. Therefore the established hybrid model presents the potential to be applied to short term load prediction.

KEYWORDS
Least squares support vector machines; Moth-flame algorithm; Optimization; Swarm intelligence