

Support Vector Regression Combined with Different Optimization Algorithms to Predict Global Solar Radiation on Horizontal Surfaces in Algeria

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Abstract : The aim of this work is to use Support Vector regression (SVR) combined with dragonfly, firefly, Bee Colony and particle swarm Optimization algorithm to predict global solar radiation on horizontal surfaces in some cities in Algeria. Combining these optimization algorithms with SVR aims principally to enhance accuracy by fine-tuning the parameters, speeding up the convergence of the SVR model, and exploring a larger search space efficiently; these parameters are the regularization parameter (C), kernel parameters, and epsilon parameter. By doing so, the aim is to improve the generalization and predictive accuracy of the SVR model. Overall, the aim is to leverage the strengths of both SVR and optimization algorithms to create a more powerful and effective regression model for various cities and under different climate conditions. Results demonstrate close agreement between predicted and measured data in terms of different metrics. In summary, SVM has proven to be a valuable tool in modeling global solar radiation, offering accurate predictions and demonstrating versatility when combined with other algorithms or used in hybrid forecasting models.

Keywords : support vector regression (SVR), optimization algorithms, global solar radiation prediction, hybrid forecasting models

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