An application of hybrid swarm intelligence algorithms for dengue outbreak prediction

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ABSTRACT

Dengue fever is a hazardous infectious disease which is channeled by Aedes mosquito. A serious infection of dengue may lead to a potentially lethal complication, known as severe dengue, which includes Dengue Haemorrhagic Fever and shock syndrome. In recent decades, this disease becomes a global burden which has grown dramatically around the world. Unfortunately, until today, a specific anti-viral medicine for dengue is still undiscovered. Therefore, it is a huge responsibility to the community in finding an effective solution to prevent a widespread of this disease in advance. Concerning this matter, this study presents an application of hybrid Swarm Intelligence (SI) algorithms for a dengue outbreak prediction. For simulation purposes, a monthly dengue cases time series data in the area of Indonesia were employed, which are fed to four hybrid SI algorithms, namely Moth Flame Optimization (MFO), Grey Wolf Optimizer (GWO), Firefly Algorithm (FA) and Artificial Bee Colony (ABC) algorithm. These algorithms are individually hybrid with Least Squares Support Vector Machines. Guided by Mean Square Error (MSE) and Root Mean Square Percentage Error (RMSPE), findings of the study indicate that the identified hybrid algorithms were able to produce competitive result, with a slightly favor to ABCLSSVM.

ACKNOWLEDGEMENTS