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Hybrid of Swarm Intelligent Algorithms in Medical Applications
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Abstract
In this paper, we designed a hybrid of swarm intelligence algorithms to diagnose hepatitis, breast tissue, and dermatology conditions in patients with such infection. The effectiveness of hybrid swarm intelligent algorithms was studied since no single algorithm is effective in solving all types of problems. In this study, feed forward and Elman recurrent neural network (ERN) with swarm intelligent algorithms is used for the classification of the mentioned diseases. The capabilities of six (6) global optimization learning algorithms were studied and their performances in training as well as testing were compared. These algorithms include: Hybrid of Cuckoo Search algorithm and Levenberg-Marquardt (LM) (CSLM), Cuckoo Search algorithm (CS) and backpropagation (BP) (CSBP), CS and ERN (CSERN), Artificial Bee Colony (ABC) and LM (ABCLM), ABC and BP (ABCBP), Genetic Algorithm (GA) and BP (GANN). Simulation comparative results indicated that the classification accuracy and run time of the CSLM outperform the CSERN, GANN, ABCBP, ABCLM, and CSBP in the breast tissue dataset. On the other hand, the CSERN performs better than the CSLM, GANN, ABCBP, ABCLM, and CSBP in both the dermatology and hepatitis datasets. The results obtained could allow researchers to quickly identify the most suitable algorithm for application in a particular medical dataset. © Springer Nature Singapore Pte Ltd. 2019.

Author Keywords
Artificial bee colony; Breast tissue; Cuckoo search algorithm; Dermatology; Genetic algorithm; Hepatitis; Neural network

Index Keywords
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