Abstract

Because of computational drawbacks of conventional numerical methods in solving complex optimization problems, researchers may have to rely on meta-heuristic algorithms. Particle swarm optimization (PSO) is one of the most widely used algorithms due to its simplicity of implementation and fast convergence speed. Also, the cuckoo search algorithm is a recently developed meta-heuristic optimization algorithm, which is suitable for solving optimization problems. Normally, the parameters of the cuckoo search are kept constant. This may make algorithm suffering from slow convergence rate. To overcome with this issue, a hybrid algorithm called (PSO-CS classifier) for adjusting the cuckoo search parameters is presented to improved cuckoo search algorithm by particle swarm optimization (PSO) for training recurrent neural network which its weights and bias trained using the (PSO-CS classifier) to deviate from being stuck in local minima) for two benchmark classification problems. Moreover, to combine the ability of social communication in PSO with the local search capability of CS. Finally, the performance of the proposed algorithm is compared with that of the standard cuckoo search and PSO Algorithms. The simulation results show that the proposed (PSO-CS classifier)
algorithm performs better than other algorithms in decrease number of training errors with a fast convergence rate and high accuracy.

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Keywords

Particle swarm optimization (PSO); cuckoo search algorithm (CS); Recurrent Neural Networks (RNN); Classification.