A NEW SIMPLIFIED SWARM OPTIMIZATION (SSO) USING EXCHANGE LOCAL SEARCH SCHEME

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ABSTRACT. *Swarm-based optimization algorithms have demonstrated to have effective ability to solve the classification problem in multiclass databases. However, these algorithms tend to suffer from premature convergence in the high dimensional problem space. This paper proposes a novel simplified swarm optimization (SSO) algorithm to overcome the above convergence problem by incorporating it with the new local search strategy. The proposed algorithm can find a better solution from the neighbourhood of the current solution produced by SSO. The performance of the proposed algorithm has been evaluated by using 13 different widely used databases and compared with the standard PSO and three other well-known classification algorithms. In addition, the practicability of the approach is studied by applying it in analysing golf swing from weight shift data. Empirical results illustrate that the proposed algorithm can achieve the highest classification accuracy.*
Keywords: Particle swarm optimization, Discrete particle swarm optimization, Simplified swarm optimization, Local search, Data classification, Data mining

1. **Introduction.** Data mining is the process of analysing data from different perspectives and summarizing it into useful information. It blends the traditional data analysis methods with sophisticated algorithms for processing large volumes of data [1]. It has been widely used and unifies research in fields such as statistics, databases, machine learning and artificial intelligence (AI). Regarding that, data mining has been seen as an explosion of interest from both academia and industry to alleviate the process of visualizing and understanding the pattern of the data. Data mining applies specific algorithm to extracting meaningful knowledge so that the discovered knowledge can be applied in the related areas to increase the working efficiency and also improve the quality of decision making [2].