Enhanced Imperialist Competitive Algorithm for the Cell Formation Problem Using Sequence Data

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Abstract : Imperialist competitive algorithm (ICA) is a recent meta-heuristic method that is inspired by the social evolutions for solving NP-Hard problems. The ICA is a population based algorithm which has achieved a great performance in comparison to other meta-heuristics. This study is about developing enhanced ICA approach to solve the cell formation problem (CFP) using sequence data. In addition to the conventional ICA, an enhanced version of ICA, namely EICA, applies local search techniques to add more intensification aptitude and embed the features of exploration and intensification more successfully. Suitable performance measures are used to compare the proposed algorithms with some other powerful solution approaches in the literature. In the same way, for checking the proficiency of algorithms, forty test problems are presented. Five benchmark problems have sequence data, and other ones are based on 0-1 matrices modified to sequence based problems. Computational results elucidate the efficiency of the EICA in solving CFP problems.

Keywords : cell formation problem, group technology, imperialist competitive algorithm, sequence data

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