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A binary particle swarm optimization based on the surrogate information with proportional acceleration coefficients for the 0-1 multidimensional knapsack problem/ Lin, Chin-Jung; Chern, Maw-Sheng; Chih, Mingchang

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Abstrak

The 0-1 multidimensional knapsack problem (MKP) has been proven it belongs to difficult NP-har combinatorial optimization problems. There are various search algorithms based on population concept to solv these problems. the particle swarm optimization (PSO) technique is adapted in our stucy, which proposes a novel PSO algorithm, namely, the binary PSO based on surrogate information with proportional acceleration coefficients (BPSOSIPAC). the proposed algorithm was tasted on 135 benchmark problems from the OR-Library to validate and demonstrate the efficiency in solving multidimensional knapsack problems. The result were then compared with those in the other nine existing PSO algorithms. The simulation and evaluation result showed that the proposed algorithm, BPSOSIPAC, is superior to the of successful runs, average eror (AE) , mean absolute deviation, mean absolute percentage error, last error, standard deviation, best profit, mean profit, worst profit, AE of the best profit (%), AE of the mean profit deviaton.