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## $\epsilon$ -constraint heat transfer search ( $\epsilon$ -HTS) algorithm for solving multi-objective engineering design problems

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### Abstract:

In this paper, an effective  $\epsilon$ -constraint heat transfer search ( $\epsilon$ -HTS) algorithm for the multi-objective engineering design problems is presented. This algorithm is developed to solve multi-objective optimization problems by evaluating a set of single objective sub-problems. The effectiveness of the proposed algorithm is checked by implementing it on multi-objective benchmark problems that have various characteristics of Pareto front such as discrete, convex, and non-convex. This algorithm is also tested for several distinctive multi-objective engineering design problems, such as four bar truss problem, gear train problem, multi-plate disc brake design, speed reducer problem, welded beam design, and spring design problem. Moreover, the numerical experimentation shows that the proposed algorithm generates the solution to represent true Pareto front.

**Keywords:** Multi-objective optimization, heat transfer search, design optimization, Pareto front

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