

## Development of a Robust Algorithm for Solving Multi-Objective Optimization (MOO) Problems

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This paper describes the development of a robust algorithm for multi-objective optimization, known as robust multi-objective simulated annealing (rMOSA). rMOSA is a simulated annealing based multi-objective optimization algorithm, in which two new mechanisms are incorporated: 1) to speed up the process of convergence to attain Pareto front (or a set of non-dominating solutions) and 2) to get uniform non-dominating solutions along the final Pareto front. First, a simple MOSA is developed, and then the proposed two new mechanisms are implemented on top of simple MOSA to develop a robust algorithm for MOSA (i.e., rMOSA). The proposed new mechanisms are proved to help rMOSA to obtain quick converged, well crowded and uniform Pareto sets, for all the problems considered in this study. Hence, rMOSA can be considered as one of the best algorithm for solving MOO problems in chemical as well as other fields of engineering.

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