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Hybrid Niche Cultural Algorithm for Numerical Global Optimization

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Abstract: Many evolutionary computational models have been introduced for solving engineering optimization problems that usually intend to find the global optimum solution. These methods, however, expose high computational effort and lack the diversity of the population and hence remain trapped in a local optimum . In this paper, we propose new hybrid optimization model, where a version of niche Cultural Algorithm is integrated with Tabu Search to guide the fittest individuals to new promising areas, aiming to escape local optima. The proposed approach significantly improves the performance of Cultural Algorithm by maintaining a high diversity among the population of problem solvers. This helps avoid premature and enhances located solutions. The technique is tested using a set of realparameter optimization benchmark problems. The results in all cases indicate that the proposed method is capable of obtaining the optimal solutions with small number of function evaluations.