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## Socio-Cultural Evolution via Neighborhood Restructuring in Intricate Multi-Layered Networks

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**Abstract:** Over the last three decades, many algorithms have been introduced for solving optimization problems of various complexity. Previous work in the optimization field on practical problems, using Cultural Algorithms, had shown that cultural learning emerged as the result of meta-level swarming of knowledge sources. This paper explores the use of meaningful neighbors in Cultural Algorithms for the constructed social metaphor. The algorithm uses an enhanced multi-layer tactical restructuring to dynamically change the topology of agents in the formed networks, periodically during an algorithm run as a diversity preserving-measure. The approach has been applied to solve the set of real world problems proposed for the IEEE-CEC2011 evolutionary algorithm competition. Our results suggest that under appropriate parameter settings, the use of modified graphs of neighborhoods with a probabilistic disruptive re-structuring of the topology produces better results on the considered test functions compared to the best known scores of other algorithms from the literature.