

A Chaotic Teaching Learning Based Optimization Algorithm for Optimization Emergency Flood Evacuation Routing

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ABSTRACT

One of the key issues in any major flood disaster relates to the evacuation of victims. Given human lives is at stake, the evacuation process involving flood disaster needs to be undertaken in timely and efficient manner. An evacuation routing plan should be optimally constructed considering the current resources and constraints available at that particular moment. Addressing this issue, this paper proposes the adoption and enhancement of the meta-heuristic algorithm, called Teaching Learning based Optimization (TLBO), to optimize the flood evacuation routing. Unlike competing work, the proposed work dwells on TLBO as parameter free algorithm (i.e. free from tuning). In this manner, the results reflect the actual algorithm's optimal performance without the necessity of painstakingly difficult tuning process that potentially leads to false optimum solution. The novelty of our work is the fact that we enhance TLBO with elitism and chaotic behavior ensuring its effectiveness for global exploration and local exploitation. Our benchmarks of our enhanced TLBO against original TLBO and Hill Climbing Algorithm for flood routing optimization have shown promising results.

KEYWORDS: Flood Routing; Teaching Learning based; Optimization Algorithm; Chaotic Behavior