Finding the shortest path with honey-bee mating optimization algorithm in project management problems with constrained/unconstrained resources

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Abstract Effective project management requires the development of a realistic plan and a clear communication of the plan from the beginning to the end of the project. The critical path method (CPM) of scheduling is the fundamental tool used to develop and interconnect project plans. Ensuring the integrity and transparency of those schedules is paramount for project success. The complex and discrete nature of the solution domain for such problems causes failing of traditional and gradient-based methods in finding the optimal or even feasible solution in some cases. The difficulties encountered in scheduling construction projects with resource constraints are highlighted by means of a simplified bridge construction problem and a basic masonry construction problem. The honey-bee mating optimization (HBMO) algorithm has been previously adopted to solve mathematical and engineering problems and has proven to be efficient for searching optimal solutions in large-problem domains. This paper presents the HBMO algorithm for scheduling projects with both constrained and unconstrained resources. Results show that the HBMO algorithm is applica-

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