A Chaos With Discrete Multi-Objective Particle Swarm Optimization For Pavement Maintenance

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A B S T R A C T

Particle Swarm Optimization (PSO) is a very popular technique in swarm intelligence. PSO has been applied to solve many problems that have single or multi-objectives. In fact, the multi-objectives optimization problems in real life are combinatorial in nature. Therefore, PSO has been developed to be able to handle large number of decision variables and reduce computational complexity. In this paper, a chaos multi objective PSO algorithm is developed for solving discrete (binary) optimization problems. The developed algorithm is applied to pavement management problem to find optimal maintenance and rehabilitation plan for flexible pavement with maximum pavement conditions and minimum maintenance cost. The results show that there is significant improvement in the solutions satisfying pavement conditions and maintenance cost objectives. It is required to a very short time of execution by the developed algorithm to reach a very good solution. In addition, it is found that it is able to converge to the solution faster than another PSO algorithm.