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

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A B S T R A C T

Particle Swarm Optimization (PSO) is a very common algorithm in swarm intelligence algorithms. PSO has been used to solve a lot of problems with one or more goals. Actuality, the multi-objectives improvement issues in all real life are combinatorial in nature. Therefore, PSO has been improved to be able to handle very large number of decision variables and reduce or decrease computational complexity. In this work, a chaos multi objective PSO algorithm is improved for solving discrete (binary) optimization issues with crossover operation. The developed Chaos Discrete Multi Objective PSO (CDMOPSO) algorithm is applied to pavement management problem for flexible pavement to get optimal maintenance and rehabilitation plan. The results shown that there is significant improvement in the solutions satisfying pavement conditions and maintenance cost goals. It is required to a very short time of execution by the improved algorithm to reach a very good solution. Also, comparing the convergence of solutions with the rest of the PSO algorithms, it has found that the suggested algorithm is better.