

عنوان مقاله:

Evaluation and comparison of improved particle swarm optimization for solving the multi-modal routing problem in an urban transportation network

محل انتشار:

سومین کنفرانس محیط زیست، عمران، معماری و شهرسازی (سال: 1399)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

In this study, routing in urban transportation networks is discussed. To solve the problem, genetic algorithm (GA) and particle swarm optimization (PSO) have been implemented. In this study, a network of subways, buses, and walking is assumed. The fitness function is to minimize the route length. Also, to be efficient, five changes were added along the route. The routing problem is inherently an optimization problem with discrete search space. To solve the problem using particle swarm optimization, the algorithm is improved to the discrete state. The reason for the continuous optimization of particle swarm optimization is the inertia velocity vector. In the developed algorithm, this vector is removed and used from the previous position vector of the particle. The simulated data, including the random coordinates of 200 stations at a surface of 1600 km², is considered to create the multi-modal network. Finally, the results of the developed algorithm compared to the genetic algorithm show that the developed algorithm finds the optimal solution in a small number of generations and time. Also, the route found by the developed algorithm is more efficient. In this study, discrete particle swarm optimization (DPSO) has a better performance for solving the multi-modal routing problem than the genetic algorithm.

کلمات کلیدی:

Discrete particle swarm optimization (DPSO), genetic algorithm (GA), optimization, multi-modal routing, urban transportation network

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