

# 應用粒子族群最佳化演算法規劃物流中心之揀貨路徑

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## 摘要

The performance of a distribution center is typically judged on throughput-based criteria. The order picking operations almost consumed 30% to 40% time in a typical distribution center. However, it is a nonlinear programming problem. So, it is not easy to employ traditional optimization methods. Therefore, we developed a new algorithm that is applying Particle Swarm Optimization (PSO) to design picking. PSO is one of the latest swarm intelligence algorithms proposed recently. Compared to previous sophisticated algorithms, such as genetic algorithms and simulated annealing, the study on the properties and applications of the PSO is still at infancy stage. Therefore, in this research, it is developed to apply PSO to route planning. Based on the PSO, it considered speed, position, and fitness function, so it proposed to apply PSO in order picking system. Also, it tried to use heuristic algorithm to find out the initial solution in order to find the optimal solution faster by PSO. This paper also compared the effects of different parameters on the particle swarm optimization. In order to verify the result, it also compared with the ant system in finding the optimal solution in route planning. Overall, the research result will enhance the best route planning of order picking systems in distribution center in order to improve the efficiency of order picking operations.

關鍵字：picking routing, particle swarm optimization