

Penerapan algoritma hybrid artificial bee colony dalam menyelesaikan environmental vehicle routing problem = The application of hybrid artificial bee colony algorithm for environmental vehicle routing problem

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Abstrak

ABSTRAK

Vehicle Routing Problem (VRP) merupakan masalah kritis dan penting dalam bidang logistik untuk mendesain suatu jaringan transportasi yang efektif dan efisien. Di antara berbagai jenis VRP, Capacitated Vehicle Routing Problem (CVRP) telah banyak dipelajari secara luas oleh banyak peneliti karena dalam prakteknya sangat relevan dengan operasi logistik. Namun, CVRP yang bertujuan meminimalkan perjalanan jarak keseluruhan atau meminimalkan waktu perjalanan ternyata tidak memenuhi persyaratan terbaru yaitu Green Logistics, yang memperhatikan pengaruh terhadap lingkungan. Pada skripsi ini mempelajari CVRP dari perspektif lingkungan yang disebut Environmental Vehicle Routing Problem (EVRP) dengan tujuan mengurangi dampak buruk pada lingkungan yang disebabkan oleh routing dari kendaraan. Dalam skripsi ini, pengaruh lingkungan diukur melalui jumlah emisi yang dikeluarkan pada saat melakukan aktifitas logistik. Salah satu teknik yang dapat digunakan untuk menyelesaikan masalah EVRP adalah dengan menggunakan metode metaheuristik yaitu algoritma Hybrid Artificial Bee Colony (HABC). Algoritma HABC merupakan modifikasi dari algoritma Artificial Bee Colony (ABC) dengan algoritma Clarke-Wright Savings untuk pembentukan rute awal.

ABSTRACT

The vehicle routing problem (VRP) is a critical and vital problem in logistics for the design of an effective and efficient transportation network. Among the various types of VRP, Capacitated Vehicle Routing Problem (CVRP) has been studied extensively because in practice it is very relevant to logistics operations. However, CVRP aimed at minimizing traveling distance or minimize overall travel time did not meet the latest requirements of Green Logistics, which pay attention to the effect on the environment. In this thesis studied the CVRP from an environmental perspective, called the Environmental Vehicle Routing Problem (EVRP) with the aim of reducing the adverse effect on the environment caused by the routing of vehicles. In this research, the environmental influence is measured through the amount of the emission, which is a widely acknowledged criteria and accounts for the major influence on environment. A hybrid artificial bee colony algorithm (HABC) is designed to solve the EVRP model. The artificial bee colony is a swarm intelligent, which mimics the foraging behavior of a honey bee swarm. An hybrid artificial bee colony algorithm is also proposed to improve the solution quality of the original version. HABC algorithm is a modification of the algorithm Artificial Bee Colony (ABC) algorithm Clarke-Wright Savings as the formation of the initial route.