

Power Electronics and Engineering Application

Ant Colony Algorithm Based on Path Planning for Mobile Agent Migration

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Abstract

Analysis of the travel agent questions (Travelling Agent Problem, TAP), and that it is a class of complex combinatorial optimization problems, mobile agent migration path planning is the most classic problems; Second, for ant colony algorithm to solve such problems in need long search time and ease into a local minimum shortcomings, the introduction of genetic algorithms and ant colony algorithm for global and local updating rules to improve, greatly reducing the travel agent ant colony algorithm to solve problems caused by the system into a local minimum stagnation phenomenon may be; Finally, through simulation experiments verify the validity of the proposed algorithm.

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1 .Introduction

Mobile agent in the network environment in accordance with its current mission requirements and network load to choose to move to a host one or several sub-tasks to complete the current task is complete and then move to another host to continue its subtasks, until the computational tasks execution is completed or fails.

How to plan the movement path of mobile agent is particularly important, Moizumi definition of travel agent the following issues: distributed network computing environment, there are hosts, the numbers were. Starting from the host mobile agent to perform a task, mobile agent on the host to complete its mission

probability, these probabilities independent from each other. Regardless of whether the mobile agent on the host to complete its task, due to complete its task in the delay caused by both. To the host computer,. Mobile agent moves from host to host the required time. If the mobile agent to complete the task in a host, the host can be directly returned by the original host, without having to visit the rest of the host; if they failed to complete the task, the mobile agent need to continue to move to another host until the task is completed or completed through All hosts are unable to complete its task so far, on the way up to one visit per host. The problem is to find a travel agent makes the mobile agent to complete the task the expected minimum time required to move the path.

Research travel agent issue is important because the travel agent to solve the problem, the general sense can be given from the mobile agent moves between hosts in different migration path planning, making the mobile agent to concentrate the main effort priority access to those most likely to complete their task of the host to ensure that mobile agent

Can be completed within the shortest possible time users of distributed computing tasks assigned to it, which can greatly improve the operating efficiency of mobile agent system.

Application of the basic ant algorithm travel agent problems, can make ants on behalf of a mobile agent. Ants in addition to a higher probability of selection tend to spend a short time, high concentrations of pheromone path, we should also give priority to complete the task the probability is high, the short latency of the host, because ants have visited a number of tasks in a high probability , a short delay after the host is likely to have completed the task, you can return to the original host without direct access to the rest of the host.

When the mobile agent on all hosts are unable to complete their task and eventually return to the initial host, the travel agent on the degradation of the famous traveling salesman problem (Travelling Salesman Problem, TSP), so the traveling salesman problem is a travel agent issues special case. Travel agent is to promote the traveling salesman problem. Thus, the travel agent is a very complex combinatorial optimization problems, Moizumi in his doctoral thesis in the travel agent has been proved theoretically that the problem is NP-complete, its time and space complexity is very high, which requires to solve Travel agent problems generally must have the adaptive, self-learning, distributed, parallel intelligent features, which can be within an acceptable time frame arrive at the optimal solution or near optimal solution.

2. Related Research

2.1 *Traveling Salesman Problem*

Traveling salesman problem [1] is given a set of cities and the cost of travel between cities, looking through each city only once, and eventually return to the initial cost of the smallest cities in the path of travel. Can construct such a graph: vertices in the graph for the city, the edge between vertices that inter-city lines, right along the edge of the travel costs of the lines. So, traveling salesman problem on an abstract figure in the search for the shortest Hamilton circuit [2].

Any two cities A and B, if the cost of travel from A to B and B to A equal to the cost of travel, said this is the symmetric traveling salesman problem traveling salesman problem (Symmetric Traveling Salesman Problem, STSP), otherwise known as asymmetric Traveling Salesman Problem (Asymmetric Traveling Salesman Problem, ATSP). In general, not specifically mentioned in the case of the traveling salesman problem refers to the symmetric traveling salesman problem.

n-vertex traveling salesman problem in the path refers to the sequence of vertices: where and between the sides. A path is called legal path, if.

TSP is essentially a data optimization problem can be formally described as:

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