

Adaptive routing in packet-switched networks using agents updating methods

ABSTRACT

This paper investigates a non-trivial, multi-objective and multi-constraint routing optimisation problem for dynamic packet-switched networks. The research adopts the application of the ant colony optimisation process into routing and congestion control in telecommunication networks. This paper suggests the use of epochal updating in conjunction with modified incremental updating to update the routing table in each switching node. The resulting new approach is called the For/Backward approach. Three updating methods (Forward, Backward, For/Backward) are simulated over a packet-switched network, representing Malaysian Backbone Network, using different combinations of traffic and geographical traffic patterns. The simulation results show a clear improvement on network performance (less average packet delay and greater throughput) using the For/Backward approach compared to the Forward and Backward methods. Furthermore, the behavior of the Forward and Backward methods is studied for inconsistency of behavior.

Keyword: Adaptive routing; Optimisation; ACO; Packet-switched networks