Abstract
The social insect metaphor for solving problems has become an emerging topic in the recent years. This approach emphasizes on direct or indirect interactions among simple agents. Swarm Intelligence offers an alternative way of designing intelligent systems. This paper explores the behavior of a group of mobile agents or robots to find the shortest path between
the food (destination) and nest (source), without any visible, central, active coordination mechanism. Feedback by the agent during traversal of the path causes more agent concentration on the path, thereby influencing the behavior of the other agents and the indirect communication allows the agent to modify their environment to influence the behavior of other agents. Several obstacles are likely to be encountered in the course of this traversal. The objective of the agent is to find an appropriate and an optimize solution to bring itself closer to the goal considering the cost, time and path availability. A typical case of Traveling Salesman Problem (TSP) is incorporated to achieve this navigation problem wherein, an agent plans a route through a number of nodes and each node or location is only visited once with the agent returning back to city of origin. The Ant Colony Optimization (ACO) is a popular approach that searches for an optimal solution in a given set of solutions. Dijkstra’s Algorithm is an approach to find the shortest route between two locations. This paper addresses method of path finding problem using this two different approaches.

Reference


Index Terms
Computer Science
Communications

Key words
Pheromone
Optimized path
Navigation
Path planning
TSP
ACO