ABSTRACT

Mobile Ad hoc NETworks (MANETs) are gaining quality to its peak these days because the users need wireless connectivity regardless of their geographic position. A MANET is a type of ad hoc network and a collection of mobile nodes that can change locations without any fixed infrastructure. Every node will act as a host or router to forward the data packets to other nodes. Black hole attack is one in every of the protection threat during which the traffic is redirected to such a node that really doesn’t exist within the network. It is a kind of Denial of Service (DoS) where a malicious node will attract all packets by incorrectly claiming a recent route to the destination and so absorb them while not forwarding them to the destination.

In this thesis, a study of Ant Colony Optimization (ACO) algorithms is used to eliminating the threat of a specific type of attack such as black hole attack. There are two different solutions are proposed here to avoid black holes, namely i) Detection of black hole attack using Ant based Routing Algorithm (ARA) and ii) Detection of black hole attack using fuzzy logic system. In the first proposed work is based on biology-inspired techniques like as Ant Colony Optimization (ACO) which has proven to be very adaptable in other problem domains have been applied to the MANETs routing problem as it forms a good fit to the problem. In ACO, the ant place of at each node calculates its pheromone value by using the forwarding ratio at the node. In the second proposed work is called fuzzy ant colony based routing protocol using fuzzy logic and SI of different objectives while retaining the merits of swarm-based intelligence algorithm. A Fuzzy Inference System (FIS) is implemented by using MATLAB 7.0 and the model is found to be satisfactory with the fuzzy input metrics and de-fuzzified output metrics. This modified protocol is compared with existing protocol by using various parameters i.e. packet delivery ratio, end-to-end delay and throughput. The increase in packet delivery ratio, throughput, and decrease in end-to-end delay, show better performance of proposed work as compared existing.

Keywords: