Optimizing Cluster-Head selection in Wireless Sensor Networks using Genetic Algorithm

ABSTRACT

Wireless sensor networks are comprised of sensor nodes. Responsibility of the sensor nodes is to sense the cluster members id parameters and forward this data to cluster head. As the nodes are densely deployed, there is a possibility that the data is redundant. So in order to remove the redundancy, cluster head performs aggregation of the data and forward this data to base station. Sensor networks have a limitation that they are limited in energy. They are mostly deployed in harsh areas where it is hard to replace the malicious nodes. One way of achieving energy efficiency and finding malicious is to use clustering technique. In clustering, clusters of sensor nodes are formed and every cluster has one cluster head. This paper discusses genetic algorithm based cluster formation techniques along with their merits and demerits.

EXISTING SYSTEM

- Internet made the world a smaller place.
- Companies from all around the world may now compete over different service offerings not only with their local adversaries, but do now under a global scale.
- To fill this gap providing a standard way to measure and predict WS behavior in terms of response time using HMM.
- Reliability of service oriented architecture (SOA) based systems heavily depend on various underlying technologies for instance web services,
computing environment (CPU, Disk, and Network) and unpredictable internet.

DISADVANTAGES

• Not always true in mobile vehicular environments.
• Unable to provide computer evaluation.
• Energy will be wasted.
• Traffic and congestion will be occurred.

PROPOSED SYSTEM

• Genetic Algorithm is an iterative process that maintains a population of solutions that are candidate solutions to the specific problem.
• In MANET, the nodes are distributed. Some of the nodes are at better position and can be considered as best nodes to reach the destination.
• We start with the population of randomly generated solution represented as chromosomes and determine how fit it is by applying fitness function.
• If the solution is good, the problem is terminated, if not the solutions are optimized for a better output by performing GA operations like Selection, Crossover and Mutation.
• Ultimately only the strongest or fittest node survives and rest are discarded.
• In the proposed work, GA has been used to solve clusterhead selection problem in the dynamic MANET environment.
ADVANTAGES

- Transmit aggregated data to the sink.
- Reducing number of nodes taking part in transmission.
- Useful energy consumption.
- Scalability for large number of nodes.
- Reduces communication overhead for both singlehop and multihop.
SYSTEM REQUIREMENTS

This chapter highlights the requirements of this project without which the fruitful fulfillment of this project is not possible. The requirements of this project may be broadly classified into two categories, namely:

1. Hardware Requirements

2. Software Requirements

HARDWARE REQUIREMENTS

The hardware requirements of this project serve as a tool for capturing the gestures of the user to be used for authentication by the system. The following are the hardware specifications:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 44 Mb.
- Monitor : 15 VGA Color.
- Ram : 512 Mb.

SOFTWARE REQUIREMENTS

The software based requirements of this project are pertinent to the tools used for the processing of the live input feed. The tools required are:
• Tools: Network Simulator-2
• Os: Linux
• Languages: Front end: TCL (Tool Command Language) Back end: C++

REFERENCES


