

Hybrid-Clustering Mobile Agents based Routing Protocol

for Heterogeneous Wireless Sensor Networks



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Declaration

I hereby declare that I have written this thesis titled as “**Hybrid-Clustering Mobile Agents based Routing Protocol for Heterogeneous Wireless Sensor Networks**” completely based on my personal efforts under the earnest guidance of my supervisor Dr. Shahzad Hassan. All citations with references to all sources used in this thesis have been mentioned clearly and contents of this thesis have not been plagiarized. I certify that this work contains no material which has-been accepted for the award of any degree, or in any university or any previously published material except where due references have been made in the text.

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Abstract

Energy efficiency and prolonging network life time is the most important concern of Wireless Sensor Networks (WSNs). Nodes of WSNs are battery operated and continuously communicate with Base Station (BS) or with each other to exchange the information. Due to limited power resources, nodes drain out quickly and life span of WSN become shorten. Researchers have proposed several techniques to minimize the energy consumption of nodes, Clustering is one approach introduced by researchers to avoid the extra energy drop of nodes in WSNs. In recent era, Heterogeneous WSN Clustering Protocols have drawn tremendous attention due to their energy efficiency and better packet delivery ratio. Our research is focused on enhance the network life time using hybrid technique i.e. single or multiple hop communication of nodes with BS and centralized or distributed clustering mechanism based on following applicable scenarios.

1. Nodes with initial high energy in networks are selected as Cluster Heads (CHs) thorough election process(Distributed Clustering). If there are more than one high energy nodes having exactly same amount of energy, in that case BS will decide the CH among them based on their distance from BS (Centralized Clustering).

2. Member nodes near to BS as compare to CH can send data directly to BS to save the cost of transmission energy which (Single Hop Communication). Nodes closely to CH can transmit their data to CH after that we use Mobile Agents (MAs) initiated from BS towards CHs for collection of aggregated data from CHs and bring sensed data back to BS (Multi Hop Communication). Using MAs in our protocol results as save the energy consumption of CHs during transmission task. Hence cluster Heads remains alive for more rounds of WSNs and save time consuming election process in every round.

We get the best results for heterogeneous WSN i.e. less energy consumption, enhanced lifespan and high stability period in a greater number of rounds

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