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POWER CONSUMPTION OF WSN USING HETEROGENEOUS POWER DISTRIBUTION TO SENSOR NODES

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Abstract:-Wireless Sensor Networks (WSNs) have more attention in community and actual everyday life. The lifetime of WSN is a critical parameter for Wireless Sensor Networks (WSNs). Wireless sensor network (WSN) refers to spatially dispersed and dedicated sensors that monitor and record the physical conditions of the environment and forward the collected data to a central location. WSNs can measure environmental conditions such as temperature, sound, pollution levels, humidity and wind. Wireless sensor node consists of sensor, trans receiver, receiver, battery. This focus on battery part of the node and the efficient utilization of energy source, that is, battery in sensor node to reduce the energy consumption of nodes, so that the network lifetime can improve. Most of the previous sensor nodes focus on uniform battery allocation. This paper focuses on improving wireless sensor network lifespan with heterogeneous spatial power consumption distributions to sensor nodes This gives solution to the lifetime–aware battery allocation problem for sensor networks with heterogeneous power distributions.

Keywords: *Wireless sensor network, lifetime, battery allocation, heterogeneous power distribution*

I INTRODUCTION

Wireless Sensor Networks (WSNs) that consist of a large number of low-power, short-lived sensor nodes. If one of the node in the network is dead, the entire Network collapses. As the node contains a fixed battery, in many instances, it seems infeasible to replace or recharge batteries of sensor nodes. Some nodes deplete their batteries more rapidly than others due to workload variations. Most of the previous sensor network lifetime enhancement techniques focused on balancing power distribution, based on the assumption of uniform battery capacity allocation among homogeneous nodes. Wireless Sensor Network is a distributed data acquisition systems consisting of numerous wireless sensor nodes. They have the potential to allow sensing in applications and environments where it was previously impossible. For example, WSNs may be used in weather monitoring, security, tactical surveillance, disaster management, and intelligent traffic control applications. Distributed infrastructure-free operation in remote locations makes replacing batteries expensive. WSN lifetime depends on the distribution of power among nodes in addition to average power consumption. In many experiment, it is very important to improve lifetime of wireless sensor nodes, which includes layer interaction, routing, medium access control, data routing algorithm is mainly use to increase lifetime of wireless sensor nodes. Previously distributing power consumption evenly among sensor nodes based on the assumption that homogenous nodes with equal battery capacities are used. Distributed battery configuration has the potential for both cost and energy efficiency in WSNs with heterogeneous spatial power consumption distributions. Conventional power balancing can be inconsistent with energy efficiency because some tasks and communication events are spatially heterogeneous In the multi-layered architecture of WSN, node which is near to head node has heavy workload because they are responsible to collect data from node which is situated far away from head node and transfer this collected data to head node. Heterogeneous battery allocation has the potential to reduce cost by reducing battery capacity for lightly loaded nodes and to increase WSN lifespan by allocating more energy to heavily loaded nodes. In brief, heterogeneous battery allocation has the potential to improve network lifespan. Some drawbacks of previous method of power consumption like when protocol selects head node, there is no consideration about energy of nodes, and since head node is single it may occur bottleneck at head node. We can increase lifetime of nodes by using variant protocols of WSN This protocol considers one node per grid to be in the idle listening state called as doze state for fixed interval of time. Thus, node does

not have to remain active throughout its ON period and its overall lifespan increases for given amount of energy.

II FUTURE WORK:

In sensor networks, where the replacement of batteries is prohibitive, the problem of lifetime maximization has become increasingly important

1. An approximate method to obtain the node partitioning. it also provided an energy–cost model for battery packs based on real data, which permits to calculate the corresponding energy under different battery pack configurations given a specific budget.

2. Based on the optimal node partitioning and energy cost model for battery packs, we can propose heuristic to solve the cost-constrained WSN energy allocation problem.

3. By using SDC protocol, a multi-state proactive algorithm, we can lower the duty cycle of each sensor node and maximize the network lifespan with lower power consumption.

III HOMOGENEOUS POWER DISTRIBUTION:

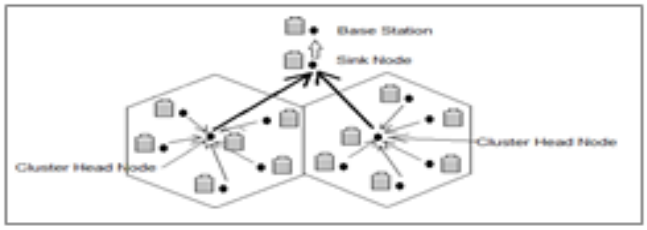

Figure1: homogeneous battery allocation of node

As fig.1 shows same battery allocation across each node. Most previous sensor network lifetime enhancement technology focused on balancing power distribution, based on assumption of uniform battery capacity allocation among homogeneous nodes.

The many to one traffic patterns in WSN also complicate energy balancing. The disadvantage of homogeneous distribution is that cluster head node have to carry more traffic and accordingly may drain off their battery power more quickly than other nodes far from the sink.

IV HETEROGENEOUS POWER DISTRIBUTION:

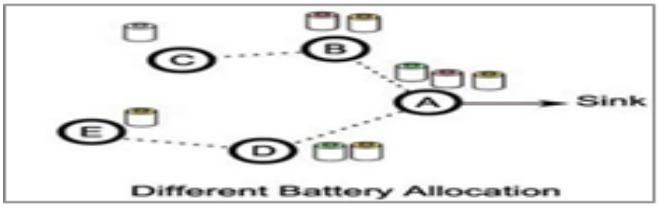

Figure 2: heterogeneous battery allocation of node

Fig.2 shows energy allocation using different battery packs. Node A allocated more energy because it transmit and receive more data whereas leaf nodes C and E allocated less energy than node A. Heterogeneous battery allocation has the potential to reduce cost by reducing battery capacity for lightly loaded nodes and to increase WSN lifespan by allocating more energy to heavily loaded nodes.

Energy Efficient Clustering and Routing in Wireless Sensor Network:

Energy efficient routing protocols are required to minimize the utilization of the power resources and prolonging the network lifetime path while transferring data.

Wireless sensor networks hold the potential to open new domains to distributed data acquisition. However, low-cost battery-powered nodes are often used to implement such networks, resulting in tight energy and communication bandwidth constraints. Cluster-based data compression and aggregation helps to reduce communication energy consumption. Wireless Sensor Network has potential to open new domains to distributed data acquisition. Cluster based data compression and aggregation helps to reduce communication energy consumption. This clustering techniques achieve more communication energy saving in uniform density network. The conventional protocols of direct transmission, minimum-transmission-energy, multihop routing, and static clustering may not be optimal for sensor networks, we propose LEACH (Low-Energy Adaptive Clustering Hierarchy), a clustering-based protocol that utilizes randomized rotation of local cluster base stations (cluster-heads) to evenly distribute the energy load among the sensors in the network.

V CONCLUSION:

In this paper, I focus on how to improve lifetime of energy wireless sensor network, for that consider power consumption of WSN using heterogeneous power distribution to sensor nodes. Here I explain difference between previous energy balancing techniques as homogeneous node WSNs with heterogeneous power distribution. Also I explain energy efficient clustering and routing in wireless sensor network.

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