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New Technology for Mobility Based Wireless Sensor Networks

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Abstract*: Cell Phone Based WSN of compressed micro- sensors for data acquirement supervise some surroundings distinctiveness, such as noise, trembling, temperature, and strain. These sensors are entrenched devices accomplished of data communication. In numerous of applications, sensor nodes are deployed over a geo-graphically large region. Due to their configuration, data of measured values must be transferred among stations through these sensor nodes. For this reason a successful, energy efficient routing protocol should be implemented to avoid data loss and additional challenges within limited energy levels. This paper presents a mobility based routing algorithm for wireless sensor networks, based on the selection of the scheme of dynamic nodes. The key objective is to boost the lifetime of a sensor network while not compromising data delivery. Significant tasks such as, scrutinize, supervise and determining of energy levels of nodes are handled by these independent mechanisms.*

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Keywords: WSN, WSNs Protocols, Cluster Based Routing Protocol, Energy Level.

INTRODUCTION

The speedy enlargement of technology has specified increase to a new class of distributed systems known as Mobility Based Wireless Sensor Networks. A WSN consists of several sensor nodes that have the capability to converse among themselves using radio antenna. These nodes are tiny in size with limited memory, energy source and processing power. Hence they all work together in collaboration as a network towards reaching a general goal of sensing a physical parameter over a large geographic area with superior accuracy. The Wireless Sensor Networks are measured as influential sensing network to the present day world due to their agreeable support to a diversity of real-world applications. The elasticity in its use is also the cause for it to be a demanding research and engineering problem. Wireless Sensor nodes are constrained in energy provide and bandwidth. Thus, inventive techniques that eradicate energy inefficiencies that would abbreviate the lifetime of the network are extremely required. Such constraints collective with a distinctive deployment of big number of sensor nodes pretense many challenges to the supervision of Wireless Sensor Networks and require energy consciousness at all layers of the networking protocol stack. Several new algorithms have been proposed for the routing problem in Wireless Sensor Networks. These routing m echanisms have taken into consideration the inherent features of WSNs along with the application and architecture requirements. The task of finding and maintaining routes in WSNs is nontrivial since energy restrictions and sudden changes in node status (e.g., failure) cause frequent and unpredictable topological changes. Routing techniques proposed here employ some well-known routing tactics to minimize latency and energy consumption e.g., data aggregation and clustering.

SURVEY WORK

Routing in Wireless Sensor Networks is extremely demanding due to some intrinsic characteristics.

- Since the addressing scheme is not well appropriate and enormous number of nodes makes it more complex. Thus addressing scheme problem cannot be solved by conventional IP based protocols.
- Sensor networks necessitate supervision for transferre d data in approximately all characteristic applications of communication networks.
- Sensor nodes are usually cell phone based and difficult to determine location on geographical area. Global Positioning System provides some sort of information but it's not a practicable solution.
- Many new algorithms have been proposed for the routing problem in WSNs due to dissimilar scenarios and dissimilar situations. None of them overcome the above challenges.

In common, routing in WSNs can be divided into three main categories such as data-centric routing, hierarchical based (cluster based) routing, and location based routing, depending on the network structure. In flat based routing all nodes plays the same role and it is not feasible to assign a global identifier to them. Base Stations sends queries and waits for data from the sensors. Well known protocols proposed are the Sensor

Protocol for Information via Negotiation[7],[8], Directed Diffusion [9], Rumor Routing [10], Minimum Cost Forwarding Algorithm [11], Gradient based Routing [12], Information driven sensor Querying [13] etc. In a hierarchical architecture, sensor nodes are grouped and the one with the greatest residual energy is usually chosen as the cluster head. Higher energy nodes can be used to process and send the information, while low energy nodes can be used to perform the sensing task of the environment. This routing also called cluster based routing method. Some of the proposed cluster based protocols are the Low-Energy Adaptive Clustering Hierarchy [13], Power-Efficient Gathering in Sensor Information Systems [14], Threshold sensitive Energy Efficient sensor Network protocol [15]. The location information of the sensor nodes is elegantly utilized in order to determine energy efficient routing paths. The distance can be estimated according to the level of signal strength. To save energy, some location based schemes demand that nodes should go to sleep if there is no activity. Well known protocols in this category are the Minimum Energy Communication Network [4]. Geographic Adaptive Fidelity, Geographic and Energy Aware Routing, Most Forward within Radius etc.

I. MOBILITY ROUTING PROTOCOL

We present the effective standard of the proposed Cluster Protocol for Mobility Based WSN with Pseudo-code. The Abbreviate Lifetime WSNs protocol (ALWP) works into the following phases.

A. *Cluster start assortment*

The Clusters are formed based on the environmental locations of sensors by base station and selects cluster heads based on the remaining energy and position of the sensors. Since all nodes, have the same preliminary energy, cluster head is selected based on a random number between zero and one and cluster heads probability, which is comparable to the method used in the Low-Energy Adaptive Clustering Hierarchy protocol [2]. Once cluster heads are selected they broadcast their positions and identification details. A node N is assigned to a cluster if the cluster head of that cluster is at the minimum Distance with N. The node N then sends a registration message to the cluster heads with its identification details and current position. Cluster heads send cluster information to Base Station for centralized control and operations. We assume that each cluster head that is selected at the beginning of a round is static until a new cluster head is selected in the next round based on the mobility factor of nodes. After a number of rounds a new cluster formation and cluster head selection phase is initiated to balance the network energy consumptions. Once the network process starts and nodes move at a fixed speed, each node keeps track of the number of movements inside and outside of its recent cluster based on which node's mobility is calculated at each round.

The pseudo code is Given Below

```
Initialize cluster_area, number_of_clusters, cluster_id
void initial state(int cluster_information, char*
initial_CH_selection, int no_of_nodes)
void main()
{
        int i;
        char[10] k;
        initial state(i&k);
}
initial node(cluster_information, initial_CH_selection)
{
        for(int i=1;i<no_of_nodes;i++)
        {
                for(int j=1;j<no_of_clusters;j++)
                {
                for(k=1;k<=i;k++)
                {
        if(position[node[i]=cluster_area[cluster_id[j]]
        {
                node[i]=cluster_id[j]
        }
                }
        }
        }
        for(j=1;j<=i;j++)
        {
                CHprobnode[i][j]=random(0,1);
                if(CHprobneode[i][j]<CHprobability)
                {
                        CH[i]=node[j];
                }
        }
```

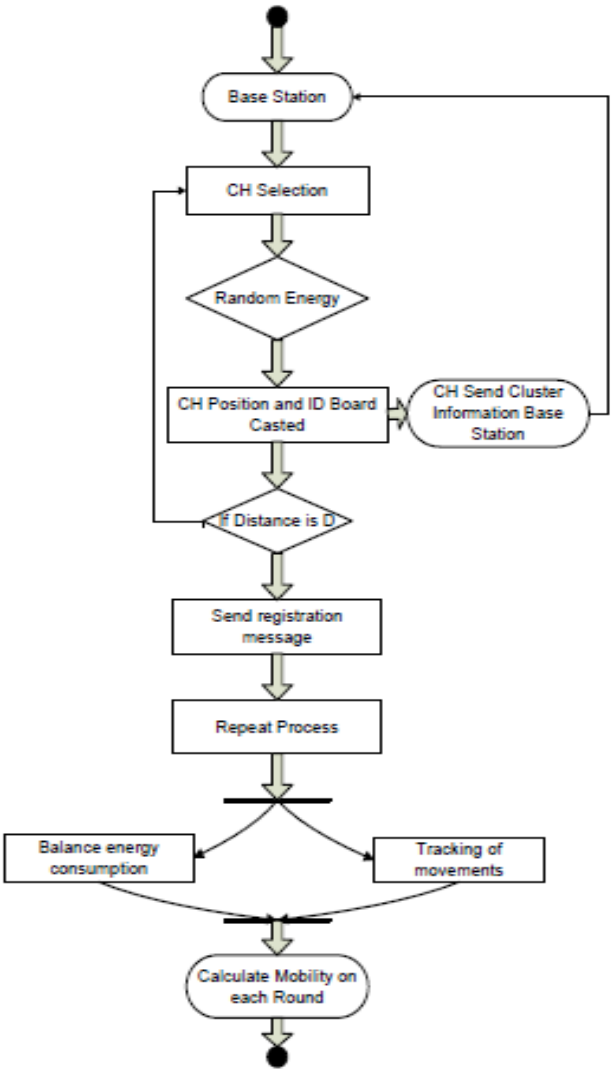

Figure 1: Cluster Start Assortment

Find out Node Mobility factor: The mobility factor is resolute as the probability of a node to shift into a dissimilar cluster during the stable era and is intended as the proportion of the quantity of times a node enters unrelated clusters to the quantity of times a node changes positions inside a cluster.
Hence, the least quantity of times a node enters additional clusters it will have the least mobility factor. Every node maintain path of the present time of the start of its owed timeslot in two uninterrupted frames.

Unwavering segment Pseudo -code

```
initialize cluster_area, number_of_clusters, cluster_id
void unwavening segment(int TDMA, float
mobility_calculation, char *new CHselection,
int data_packet)
{
int r;
for(int i=1;i<=r;i++)
{
for(int j=1;j<=k;j++)
{
if(node[k][j]=sensevent),node[k][j] sends data to CH,
calculates dataenergyconsumption[k][j] calculate receive
energy
CH sends acknowledgement
}
else node[k][j] sends special packet calculate
specialenergyconsumtion[k][j]
calculate receive energy CH[k]
CH sends acknowledgement node[k][j]
}
if(node[k][j] moves inside the cluster k
{
++countmoveinsidecluster[node[k][j]]
}
if CH not receive data from[k][j]
 {
delete node[k][j] notify BS about [k][j]
}
else if node[k][j] not receive acknowledgement from CH
{broadcast join request
if BS receive new node and moved node for node[k][j]
{
mark node[k][j] as moved
++countmoveoutsidecluster[node[k][j]]
}
else if CH receive new node or move node
{
mark node[k][j] as failed
}
}
CH[k] aggregates data and send to BS
CH energy consumption[k] for aggregating, sending to BS
}
```

At any time the node N sense the subscribed events at its allocated timeslot, it sends data packet to cluster heads. In case of no such sensed event of attention, the node N sends a tiny sized particular packet to notify cluster heads that it is unmoving alive or within the communication range of cluster heads. After receiving the data or individual packet cluster heads replies to N with an acknowledgment packet. If a cluster head does not receive any data or special packet from N at its allocated timeslot, the cluster head assumes that the node N either has moved out of the cluster or failed. Then cluster heads deletes the node N from its members list and also the timeslot allocated to N. cluster heads in addition notifies Base station the identification details of N. On the other hand, whenever node x does not receive any acknowledgment packet from cluster head N it assumes that it is no longer attached to its cluster head due to mobility. Then N broadcasts a J-R packet (Join- Request) and the cluster heads that are within the communication range of N and in addition have free timeslot replies N with an A-J (Acknowledgment to join) packet. Then N registers to the cluster of the Cluster Heads from which N receives the A-J packet with the maximum signal strength.

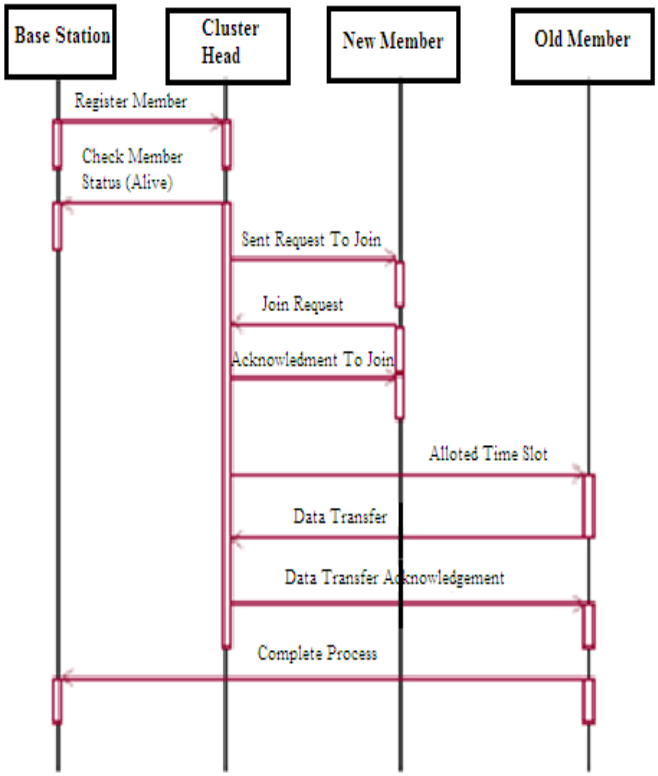

Figure 2: Node Registration and Data Transfer

II. SIMULATION RESULTS

Simulation results show that the energy consumptions of the LEACH and DSC protocols are much more than that of the proposed ALWP protocol over a number of rounds. Figure 3 and figure 4 demonstrates the network lifetime in terms of the remaining energy of the network over a number of rounds. Over research we discover that the energy debauchery in the LEACH and DSC protocol over rounds is much more than ALWP protocol and hence, the LEACH and DSC protocol have less network lifetime than that ALWP protocol.

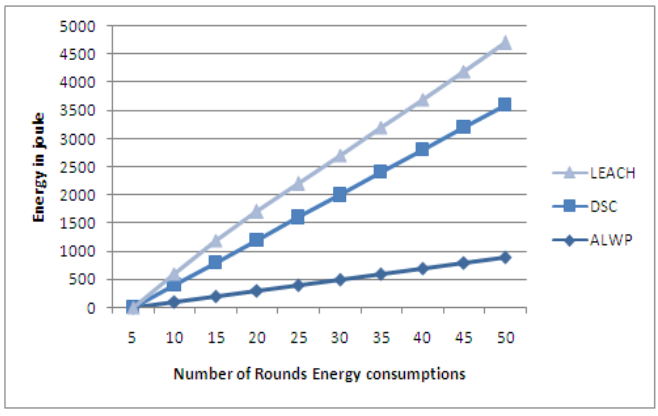

Figure 3: Energy consumption of LEACH, DSC and ALWP

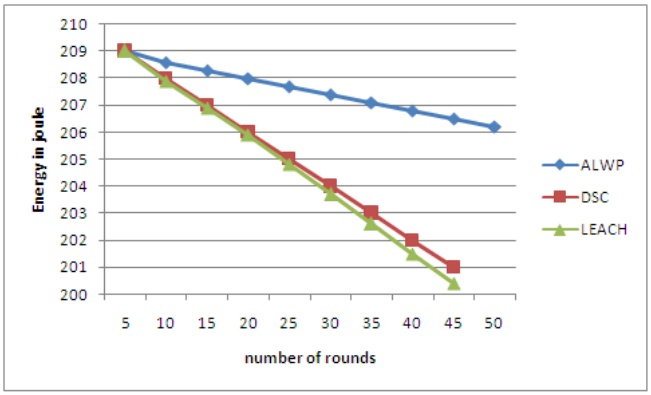

Figure 4: Network lifetime over a number of rounds

III. CONCLUSIONS

In this research we propose a new energy efficient routing algorithm which is related with distance factors and energy. Characteristic routing techniques have major purpose of boosting the lifetime of the sensor network while not compromising the data delivery. For the future work .we propose sensor mediators going to use to sense, monitor and verify the concerned data. All of the cleverness, mediators are going to be managed from a supervision center which is associated to descend, by the satellite communication.

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