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# A New Approach for Efficient Clustering Using CECM Algorithm in WSN

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**Abstract**: In this paper the proposed work is to compare the properties of the nodes in the cluster on the basis of probability of their being retrieved by other cluster or network. All this nodes and clusters contains battery level, memory, reverse signal strength indication, multicast routing information cost , time to live new node and time to live cluster on the basis of expectation clustering and maximization clustering in wireless sensor networks.

**Keywords**: Expectation, maximization, cluster head, energy efficiency, k-means, data aggregation, WSN.

## I. INTRODUCTION

A wireless sensor network consists spaciously distributed self-sufficient devices using sensors to monitor substantial or environmental conditions such as temperature, sound, vibration, pressure, motion or pollutants to collaboratively pass their data from the network to a destination or plunge where the data can be analysed and observed. A sensor node is a basic element in a sensor network, with on-board sensors, processor, memory, wireless modem and power supply. Sensor nodes contain reasonable battery power with few celestial spaces and processing power.

In a computer system, a cluster is a group of servers and other assets that act like a single system and enable high convenience and in some cases, load balancing and parallel processing. It is currently canvassing the Earth's magnetic environment and its interaction with the solar wind in three dimensions. Expectation and Maximization algorithm a habitual method to find maximum likelihood or maximum a posteriori (MAP) estimates of parameters in statistical models, where the model depends on unperceived latent variables.

K-means algorithm aims to disseverance n observations into k clusters in which each observation belongs to the cluster with the nearest contemptible, serving as an archetype of the cluster. This results in a partitioning of the data space into glial cells. K-means clustering tends to find clusters of comparable ample extent, while the expectation-maximization mechanism allows clusters to have various shapes.

## II. LITERATURE REVIEW

In data mining field nowadays there is a vast range of various fields like science research, statistical application, disaster area and War Zone. All this are related to mining of data, energy, memory, efficient techniques and data aggregation and data collection in WSN with calculation of cluster nodes, cluster head and other efficient techniques using data cube. A serviceable network is required to suffice the application quest. In addition, energy devastation of nodes is a great demur in order to maximize network endurance. Unlike other networks, it can be venturesome, very swank or even impossible to charge or replace kaput batteries due to the rancorous nature of encompassment.

The main focus of this gizmo is predominantly on duty cycling contrivance which represent the most reconcilable technique for energy saving and the data-driven passage that can be used to skyrocket the energy efficiency. We will make a review on some intercommunication protocols proposed for sensor networks. The work is how to poll the sensor nodes concretion to guarantee a full indemnity and to reduce energy devastation in a sensor network. During this paper there's a shot to allow a large analogize of the routing protocols in WSNs.

The Problem nascency does not require a prairie information about the number of clusters, and it gives a spontaneous way for superintendence missing values. We give a ceremonialistic statement of the clustering-aggregation quandary, we discuss related work, and we suggest a number of algorithms. For respective of the methods we provide unintelligible guarantees on the endowment of unravel.

## III. MECHANISM

(1) Phase 1: calculation of efficient expectation clustering
Step 1: cluster creation

Cluster-Creation ( )



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{
For (ss_id=0; ss_id<N; ss_id++)
{
If (Bcon >= Apr && Pm>=Tm)
// Bcon = Battery consumption
// Apr =Present Cluster battery level
// Pm= Present memory
// Tm= Total cluster memory
{
Node will not be Included in Cluster
}
else if (TTLnew>TTLclst)
// TTLnew= Time To Live new node
// TTLclst=Time To Live cluster
{
If ((MRICnew>MRICclst) && (RSSInew<RSSIclst) && (Bandnew>Bandclst))
// MRICnew= Multicast Routing Information Cost
//MRICclst=Multicast Routing Information Cost of cluster
//RSSInew=Reverse Signal Strength Indication of new node
//RSSIclst =Reverse Signal Strength Indication of new node
//Bandnew= Level Bandwidth new node
//Bandclst= Level Bandwidth cluster
{
No new node can join Cluster ( );
}
else
{
Join cluster;
}
}
}
}

step 2: cluster head selection on the basis of expectation clustering
for cluster1 to cluster k
{
for node1 to node n
{
sump=0;
llh=0;

for (i=0; i<=n; i++)
{

$$\delta_{ij} = (D_i - C_j)^t R^{-}(D_i - C_j)$$

$$P_i = \frac{W_j}{(2\pi)^{p/2}\,|R|} e^{[\frac{-1}{2}\delta_{ij}]}$$

Sump = sump + $P_i$;
}

llh = llh + ln(sump);
c' = c' + $Y_i X_i$ ;
w' = w' + B';
}

}

(2)phase 2: calculation of efficient maximization clustering
step 1: new node selection for maximization clustering

NewlyArrivingNodeInWSN ( )
{
Calculate the following factor
Bcon[i], Apr[i], Pm[i], Bandnew[i], Bandclst[i], TTLnew[i],Tm[i], TTLclst[i], MRICnew[i], RSSInew[i],MRICclst[i], RSSIclst[i];
Calculate C (i1), C (i2), C (i3);
Calculate GCmin;
If (newly arrive node GCmin< cluster head GCmin)
{
Assign new node as cluster head;
}
else
{
Join cluster ( );
}
}

Step 2: calculation of maximization clustering
ClusterHeadAssignment ( )
{
Total no of node = n;
For (cluster1 to cluster n)
{
For (i=0; i<n; i++)
{
/*initialize parameter for cost evaluation*/
Bcon[i] = {}; /* Battery consumption at node i*/
Apr[i] = {}; /*Present Cluster battery level at node i*/
Pm[i] = {}; /*Present memory at node i*/
Tm[i] = {}; /*Total cluster memory*/
TTLnew[i] = {}; /*Time to Live new node*/
TTLclst[i] = {}; /*Time to Live cluster*/
MRICnew[i] = {}; /* Multicast Routing Information Cost at node i*/
MRICclst[i] = {}; /* Multicast Routing Information Cost of cluster*/
RSSInew[i] = {}; /* Reverse Signal Strength Indication of new node*/
RSSIclst[i] = {}; /* Reverse Signal Strength Indication of new node*/
Bandnew[i] = {}; /* Level Bandwidth new node*/
Bandclst[i] = {}; /* Level Bandwidth cluster*/

/* now calculate the cost for each node */
C (i1) = (Apr[i]* TTLnew[i] /Bcon[i]* TTLclst[i]))
C (i2) = (Pm[i]* RSSInew[i] /Tm[i]* RSSIclst[i])
C (i3) = (MRICnew[i]*Bandnew[i]/MRICclst[i]*Bandclst[i]
}
Find out min. global cost for each node.
GCmin=∑ C (i1) + C (i2) + C (i3)

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```
}
min = 0; max = 0;
for (i=1 to n)
{ C (i1) = (Apr[i]* TTLnew[i] /Bcon[i]* TTLclst[i]))
C (i2) = (Pm[i]* RSSInew[i] /Tm[i]* RSSIclst[i])
C (i3) = (MRICnew[i]*Bandnew[i]/MRICclst[i]*Bandclst[i]}
GCmin= C (i1) + C (i2) + C (i3);
If (max< GCmin)
{
max = GCmin;
}
else if (min> GCmin)
{
min = GCmin;
}
}
}
}
```

## IV. CONCLUSION

This paper applause for better and efficient techniques for cluster head selection and calculation of nodes of data cube on the basis of weight, memory and like that other things using clustering expectation and clustering maximization algorithm. It provides efficient techniques for energy saving in clustering with CECM algorithm in WSN with data cube aggregation.

## FUTURE SCOPE

The proposed work provides efficient methods for energy in data aggregation but the field of data mining has various heterogeneous behavior in cluster node with ongoing advancement.

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## BIOGRAPHIES

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