International Journal of Engineering Technology and Management Sciences[IJETMS]

Website: ijetms.in Issue:5, Volume No.4, September-2020 DOI: 10.46647/ijetms.2020.v04i05.010

Analysis of hybrid approach for Answering holistic queries in Wireless Sensor Networks

Meenakshi Bhrugubanda

Assistant professor

Mahatma Gandhi Institute oTechnology

bmeenakshi_it@mgit.ac.in

***Abstract*—Sensor networks are greatly utilized in unique areas like the transportation methods, wellbeing monitoring, soil monitoring, habitat monitoring and so forth. Clients pose queries to sensors and acquire sensing information. In view of the low quality detecting devices, sensor information is regularly boisterous. Continuous queries are more commonly employed to increase the reliability of query result. On this work we revolve round on regular holistic queries like Median. Present methodologies are for essentially the most phase supposed for non-holistic queries like Average. As a result of the no decomposable property of sensors, answering holistic queries are given much less value. We initially recommend two ways elegant on the information correlation be tween's two rounds, with one for finding the detailed solutions and the other one for opting for the estimated outcome. We at that factor consolidate the two proposed plans into a hybrid methodology, which is flexible to the information evolving velocity. The effects show that our methodology has reduced the traffic rate even as keeping equal accuracy.**

***Keywords*— Adhoc Networks, Average, Data Aggregation, holistic query, Median, Wireless Sensor Networks.**

I. INTRODUCTION

A Wireless Sensor network (WSN) consists of thousands of sensor nodes which are deployed in adhoc fashion. WSN has its importance in quite a lot of fields ranging wild hearth monitoring and animal monitoring to agriculture administration and industrial monitoring. The sensor node includes transmitter for transmission of a signal, a transducer to transform one form of energy to different form, a processor to process the signal and memory to store these signals, a A/C converter to covert the signal from Analog form to digital form, a battery to provide energy to all these .In view that battery has limited capacity, energy is a foremost constraint in wireless sensor networks. Relying on the size and cost of sensor node power CAPACITY RAISES IN SENSOR NETWORK. The exclusive types of topologies in WSN are grid, ring topology, mesh topology, ring topology and so forth. Routing or Flooding is used as propagation technique in WSN.The properties of sensornodes are Attribute-situated addressing, query dealing with, heterogeneity of nodes, mobility of nodes, scalability of nodes, etc.

II. RELATED WORKS

E.G. Prathima et .al proposed Data aggregation using mobile sink (DAMS) protocol using that allows the mobile sink to collect the data from WSN's where path of the mobile sink is not known priori. DAMS protocol improved its performance compared to SinkTrail[1]

Yeqing Yi∗ et.al proposed link watering scheme. As storage contains actual data, they are prone to more attacks .In this protocol storage nodes process queries, and sink node to detect the malfunctioning of storage node

Yang yao[7] et.al introduced Coughar approach. In this they introduced declarative queries. In this procedure the user introduces queries ,the query optimizer introduces efficient query plan which helps in efficient resource utilization.

Sammuel madden [18] introduced TAG: a Tiny Aggregation service for Adhoc networks .In this the user express the express simple, declarative queries and have them distributed and executed efficiently in networks of low-power, wireless sensors

Bartosz Przydatek et al.[24] introduced a unique structure to aggregate information in a secured manner for WSN. In this scheme there are aggregator nodes .These aggregator nodes helps in aggregating the information requested by a query which in turn reduces the communication overhead.

Hellerstein [4] presented a wavelet-based conglomeration plot which can likewise create consequences of expanding goals after some time.

Q-digest [6] is another sort of cans based methodology which permits covering basins. Furthermore, Q-digest ensures a blunder of O.log.s.=m. with message size of m.

Cormodeet al. [2] proposed circulated following plans for finding exact quantiles with blunder ensures. They accepted every remote site keeps up a neighborhood information stream.

Website: ijetms.in Issue:5, Volume No.4, September-2020 DOI: 10.46647/ijetms.2020.v04i05.010

Greenwald and Khanna [3] introduced calculations which can give e-inexact responses to quantile with message size O.log2.n.=".. Some different techniques, for example, Manku, and so on [19] introduced crossover inexact calculations for figuring recurrence tallies over information streams

III. EXISTING SYSTEM

Localized - Power effeciente data Aggregation Protocol (L-PEDAP) was in use. In this Tree is fashioned .On this approach the root node aggregates the data gathered from more than a few nodes. The shortest route for sink is calculated. Then the aggregated information are sending to the data sink by means of the calculated route. It also handles the route maintenance and addition and removing of nodes also. The network lifetime is diminished to half of due to the root node failure. So as to rectify this obstacle, the root node is changed by using a neighbor child node, which has the next highest transmission rate and gain a good packet delivery ratio peculiarly for high load networks

A. SDemerits of Existing system

1. The mean of the monitoring area is calculated. The noise may affect the merging area
2. Due to the constraint of message size, the merging procedure may lose some data.
3. These techniques provide approximate outcome only with some error guarantee by way of introducing different restricts and pruning algorithms

IV. PROPOSED SYSTEM

Within the proposed system correlation between the data gathered from different rounds and present two approaches to watch steady holistic queries. One for calculating the specific outcome and the opposite one for deriving the approximate outcome.

- We advisea hybrid procedure, joining F-Bucket and wavelet-like methodologies, to maintain the continuous holistic queries[8]. When the values within the sensor network are steady, precise algorithm is applied. If the values within the networks are unstable, approximate algorithm is used
- We recommend histogram based solution to handle holistic queries.In special we utilize the histogram synopsis constitution to retailer the worth dissemination process.Each and every can with in the histogram includes the range of traits in a precise range.
- We propose two calculations refining the range project ,Slip refining and Hierarchial refining

V. DATASTRUCTURE

In this method, we set up the machine with the nodes/entities required to enforce the proposed model. The nodes are deployed because the Sensor Nodes. We assume that a Median question is achieved upon a dataset S inside the range and the total variety of sensors within the network is n. We propose a histogram-primarily based method to get particular solutions for non-holistic queries

VI. QUERY PROCESSING

Although our query works on arbitrary topology systems, to simplify the discussion we count on a tree-like routing topology. All sensor nodes in the network are organized into a spanning tree rooted through a unique node called sink. Take the Median query for example, In every round the leaf node builds an F-Bucket of most effective one bucket with its personal value and transmits to its parent. An intermediate node receives F-Buckets from subnodes and merges them with its personal F-Bucket to an included one. The intermediate node then sends the brand new F-Bucket to its parent. In the stop of the round, the sink merges all the obtained F-Buckets to a final one and calculates the median end result. During a non-prevent Median query, the above technique repeats spherical through round. The range refining algorithms reveals the range in which the median fee is located and subdivides it to all intermediate buckets. After a few rounds all of the intermediate buckets deal with range of length 1 and boundary buckets take care of the rest ranges. The median charge is placed within the variety of intermediate buckets and specific median outcomes may be calculated constantly. When the median runs out the range of intermediate buckets, the range refining set of rules will modify the tiers of buckets

VII. INTERMEDIATE NODE OPERATION

Basically, the intermediate node collects the F-Buckets, merges them and sends the merged one to top level . The merging of two F-Buckets is easy because of the fact the range of each bucket is constant. We only need to merge of their count of corresponding buckets.

Algorithm :

1: Generate value v; //start processing

2: Build F-Bucket Fv;

3: Receive F-Buckets from children;

4: for all Fi in received F-Bucket list do

5: Fv = Merge (Fv, Fi);

6: end for;

International Journal of Engineering Technology and Management Sciences[IJETMS]

Website: ijetms.in Issue:5, Volume No.4, September-2020 DOI: 10.46647/ijetms.2020.v04i05.010

7: Transmit Fv; //transmit message to parent node;

VIII. RESULT CALCULATION

With the acquired F-Bucket in sink, we can answer a median question. The median result is computed the usage of the algorithm. The return value is a range that covers the query result. If the returned range is of length 1, we will get the exact median.

IX. EXPERIMENTATION

This Experiment is carried out using Windows operating system. Java language is used and NET beans tool is used .My sql database is used.

X. RESULTS AND DISCUSSION

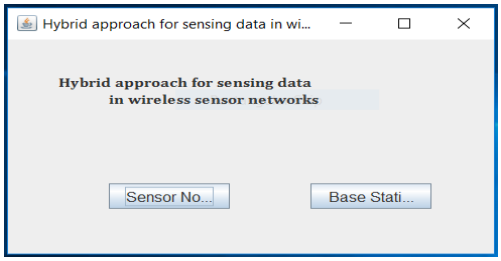

Fig 1: Hybrid approach for sensing data

Fig 1: shows the sensor no and base station

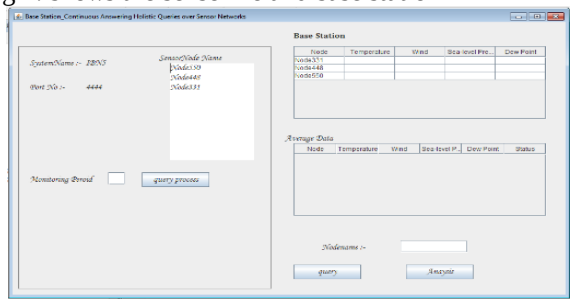

Figure 2 shows the base station

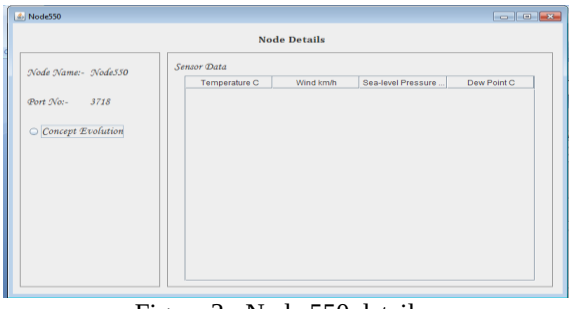

Figure 3: Node 550 details

Fig 3: shows the node 550 details such as Temperature, wind,sea-levelpressure,DewPoint,

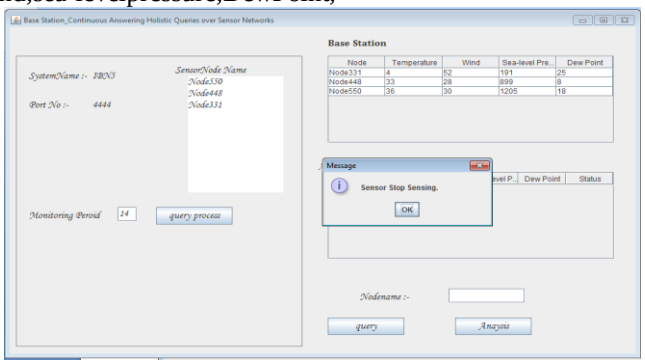

Fig 4: Base station stopped sensing

Fig 4: shows that base station has stopped sensing

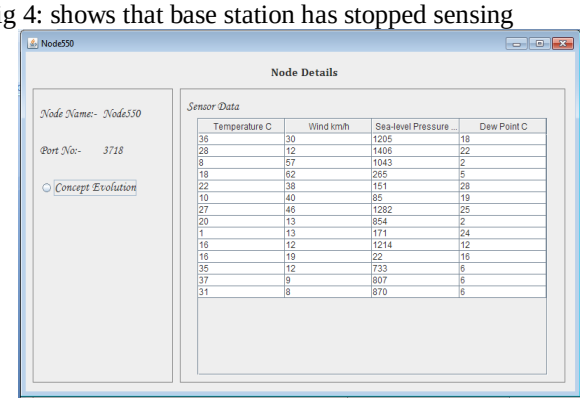

Figure 5:Node 550 details

Fig 5: shows Node 550 details like temperature ,wind,seal-leve, and Dewpoint

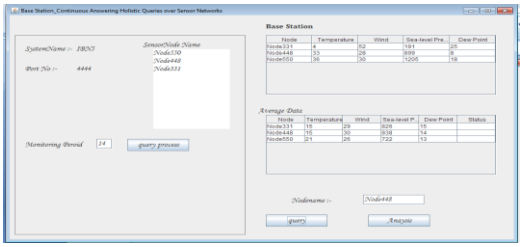

Fig 6: shows the average of the data sensed .

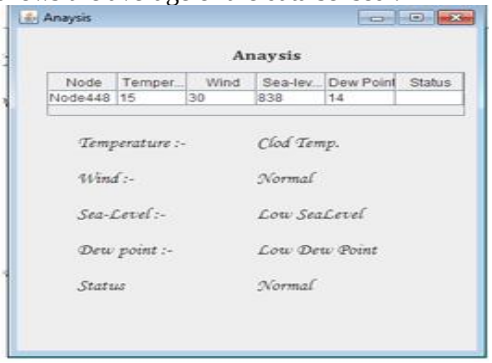

Fig 7: Analysis of node 448

Website: ijetms.in Issue:5, Volume No.4, September-2020 DOI: 10.46647/ijetms.2020.v04i05.010

Figure 7 shows the analysis of node 448 using hybrid approach

- CONCLUSION

We tackle one kind of famous queries, continuous holistic question, over sensor network. Holistic queries are very important in sensing the data in Wireless sensor networks.To keep away from sending all of the sensing statistics lower back to the sink, we recommend two procedures to reveal non-stop holistic queries, an genuine one, Flexible Bucket (F-Bucket), to answer queries as it should be and a wavelet-like approximate one to acquire the consequences with small blunders. Moreover, we present a hybrid approach based on the precise and approximation answers, which applies the precise algorithm when the data changing rate is low and makes use of the approximation one while the rate becomes high . Experimental outcomes display that the hybrid technique can achieve the same accuracy but with an awful lot less traffic value in comparison to the opposite approximate techniques.

We take one standard query Median for example to illustrate our concept. In fact, the proposed strategies may be obviously prolonged to remedy other holistic queries. For example, all Quantile queries can be solved by means of our technique with special parameters. With the precise query scheme, we acquire varying quantiles by adjusting the placement of targeted window all through range refining system. For the approximate scheme, unique quantiles can be without delay calculated with the information distribution in AF-Bucket. Generally, as both our specific and approximate schemes can return the facts distribution of all sensor values the use of F-Bucket and AF-Bucket respectively, many different sorts of queries may be answered with the information distribution.

References

[1] M. Cardei and J. Wu, "Energy-efficient coverage problems in wireless ad-hoc sensor networks," Comput. Commun., vol. 29,no. 4, pp. 413–420, 2006.

[2] G. Cormode, M. Garofalakis, S. Muthukrishnan, and R. Rastogi, "Holistic aggregates in a networked world: Distributed tracking of approximate quantiles," in Proc. ACM SIGMOD Int. Conf. Manage. Data, 2005, pp. 25–36.

[3] M. B. Greenwald and S. Khanna, "Power-conserving computation of order-statistics over sensor networks," in Proc. ACM Symp. Principles Database Syst., 2004, pp. 275–285.

[4] J. M. Hellerstein, W. Hong, S. Madden, and K. Stanek, "Beyond average: Toward sophisticated sensing with queries," in Proc. Int. Conf. Inf. Process. Sensor Netw., 2003, pp. 63–79

[5] S. Madden, M. J. Franklin, J. Hellerstein, and W. Hong, "TAG: A Tiny AGgregation service for ad-hoc sensor networks," in Proc. 5th Symp. Operating Syst. Design Implementation, 2002, pp. 131–146

[6] N. Shrivastava, C. Buragohain, D. Agrawal, and S. Suri, "Medians and beyond: New aggregation techniques for sensor networks," in Proc. 2nd ACM Conf. Embedded Netw. Sensor Syst, 2004, pp. 239–249.

[7] Y. Yao and J. Gehrke, "The cougar approach to in-network query processing in sensor networks," ACM SIGMOD Rec., vol. 31, no. 3, pp. 9–18, 2002.

[8] Liu, K., Chen, L., Li, M., Liu, Y.: Continuous answering holistic queries over sensor networks. In: Proc. of IPDPS. pp. 1-11

.