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Reliable and Efficient Data Acquisition in Wireless Sensor Network

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ABSTRACT
It has been determined that the detector nodes are deactivated or broken once exposed to specific radiations, amendment in temperature resulting in the energy debilitating problems with the detector nodes. This failure ends up in the temporary isolation of the nodes from the wireless network which ends within the formation of the holes. These holes are dynamic in kind and might increase and reduce relying upon the factors touching the failure to the detector nodes. Therefore an answer has been conferred wherever the WSN functions in twin mode i.e. frequency and also the Acoustic mode in order that the data may be transferred firmly. With the assistance of the Dynamic supply Routing, Bridge protection algorithmic program and clump techniques, additional with efficiency and faithfully the info is transferred from the supply to the destination node. During this projected work reduced the facility energy and time delay and security has been taken wherever variety of things is studied in order that the performance of the system may be exaggerated. They tend to use java primarily based machine as simulation platform to demonstrate projected model implementation.

Keywords:- SINR, CBND

I. RELATED WORK

The existing literature conjointly address completely different faults in WSNs. Khan et al. [1] projected bridge protection algorithms (BPAs)to stop the configuration from bridge fragmentation attributable to ruinous events by forming coherent response of the network. To cut back energy consumption of the bridge and stop future failure, the BPAs amendment the behavior of bridge nodes and their neighbors. For detection of WSN failure, Kamal et al. [2] projected a unique framework, named Sequence-Based Failure Detection (SBFD). This fault detection theme runs on the highest of most greedy multi-hop routing protocols. Munir et al. [3] diagnosed faults in WSNs victimization varied fault detection algorithms. They projected a duplex fault tolerant detector model consisting of 1 active detector and one inactive spare detector. However, the works of Khan et al. [8], Kamal et al. [2], and Munir et al. [3] solely thought of permanent faults. They didn't think about temporary faults of detector nodes arising attributable to internal or external reasons.

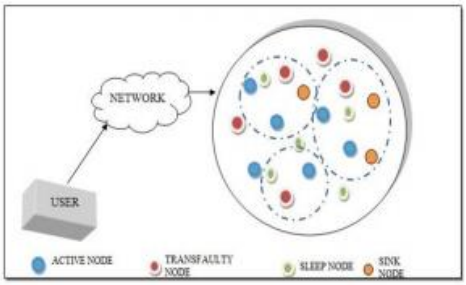
Vladimir ova et al. [4] through an experiment determined that once the frequency of two.415 gigahertz of magnetism interference, wireless jennic motes cannot operate. Shea [11] studied the area radiation effects on MEMS. He determined that attributable to the results of radiations; the sensing capability of nodes is also affected, which can cause failure of communication with the opposite nodes. Electricity sensors, however, don't seem to be suffering from radiations. Therefore, within the presence of radiation, electricity sensors still sense the physical close properly, however alternative sensors could sense incorrect information within the presence of radiations [11], [12].

Dini et al. [5] projected a way for repairing a split network by victimization mobile detector nodes. They determined the right position of mobile detector nodes, and used them to send information from one node in a very partition to a different in numerous partitions or sink. During this manner, property between the detector nodes is often re-established. Senel et al. [6] projected a spider web based mostly theme victimization the minimum spanning tree rule

to reconnect the partitioned off network attributable to the harm of detector nodes. In their projected theme, the partitioned off networks are connected by deploying relay nodes. However, the works of Dini et al. [5], and Senel et al. [6] cited on top of on property in WSN solely think about the permanent property problems that take measures for mitigating the permanent node isolation downside. However the authors didn't think about the difficulty of temporary node isolation occurring attributable to external environmental factors.

We have deployed GPS enabled homogeneous device nodes to construct a WSN. Here every of the device nodes have identical capability of sensing, sending, and receiving. Every node grasp their position by GPS or any location services [7]–[8]. to figure in radiation-prone environments and continue communication between device nodes, a node has twin mode of communication. The twin mode includes frequency (RF) communication mode and acoustic communication mode. Sometimes a device node communicates victimization the RF communication mode. The RF communication gets affected attributable to the results of radiations that disable the device nodes from human action. Therefore, within the presence of radiation effects, the device nodes switch to the acoustic communication mode. Acoustic communication doesn't get laid low with radiations [9]. So, the device nodes continue their communication within the presence of radiations victimization the acoustic communication mode.

A device node having twin mode of communication. The device nodes communicate in 3 alternative ways. The node laid low with radiations transmits the detected info victimization the acoustic communication mode, whereas it receives from different nodes victimisation the acoustic communication mode. The nodes that ar outside the radiation affected space transmit the detected info victimisation the RF communication mode and receive from others conjointly victimisation identical mode. The nodes on the boundary of the holes ought to communicate victimisation each the RF and acoustic communication modes. These nodes ought to transmit and receive victimisation each RF and acoustic communication modes to determine a bridge between the nodes human action victimisation entirely acoustic or RF communication. A node identifies itself as laid low with radiations supported its signal-to-noise-ratio (SINR) level [9] [10]. If the SINR level is higher than the communication threshold, a node identifies itself as laid low with radiations, and switches to the acoustic communication mode. If a node identifies itself to be not laid low with radiations, it continues its communication victimization RF. There are 2 major tasks gift during this theme. First, determinative the boundary nodes of dynamic natured hole produce created attributable to the results of radiations and assignment responsibility to those nodes to speak victimisation each the communication modes. Second, the gathering of correct info from these affected nodes.



II.PROPOSED WORK

In the planned theme, CBND it's necessary to spot the boundary nodes of dynamic holes for choosing the acceptable mode of communication of the nodes. The prevailing hole boundary identification schemes lack to figure with dynamic holes, that occur within the presence of radiation effects.

Propose a centralized boundary node detection (CBND) theme performed by the sink. When the readying of network, a minimum set of device nodes stay activated to hide the whole region optimally [13], [14]. We have a tendency to think about a grid-based approach to search out minimum set of nodes. During this approach, we have a tendency to divide the whole parcel into a grid having breadth and height of every cell up to the sensing radius of a node. Have a tendency to choose a node as a member of minimum set that is nearest to the middle of a grid. There are several of such minimum subsets that cowl the whole space optimally. At a time solely the device nodes among a minimum set stay activated and therefore the remainder of the device nodes attend the sleep state. Change between

the sleep and active modes follows some schedule by mistreatment round-robin schedule.

Deployment of network, the device nodes send packet format of a message to their one hop neighbors. A node prepares a neighbor list and sends it to the sink; in conjunction with its own id and mode of communication add the values or message in to table.

Steps:

1. Create wireless sensor network for data collection.

2. Design cluster based wireless sensor network for data acquisition.

3. Determining the energy of nodes and considering the trans-faulty nodes in WSN.

4. Determine radio frequency mode for sensor network.

5. Choose of source and destination nodes.

6. Moving sensor across cluster for data collection in WSN.

7. Perform routing by using the shortest path for route discovery.

8. Fault detection and recovery for the wireless sensor nodes.

9. Assign trust value to sensor node from routing table.

10. Energy efficient data collection in the presence of WSN.

Input:

N ← List of active nodes

POS ← List of positions of active nodes

σ ← Significance level

1: Begin 2: Activated nodes broadcast HELLO message 3: Active nodes create neighbor list and send it to sink 4: Sink node update table 5: Radiation affected nodes send ACTIVATION message to sleep neighbors to activate them

6: Nef ← List of Total activated nodes

7: POSef ← List of positions of total activated nodes

8: For i = 1 to |N| do

9: For j = 1 to |Nbr(ni)| do

10: If message received by Nbrj (ni) then

pi,j ← pi,j + 1,12: ri,j ← ri,j + 0 = == mesg is received

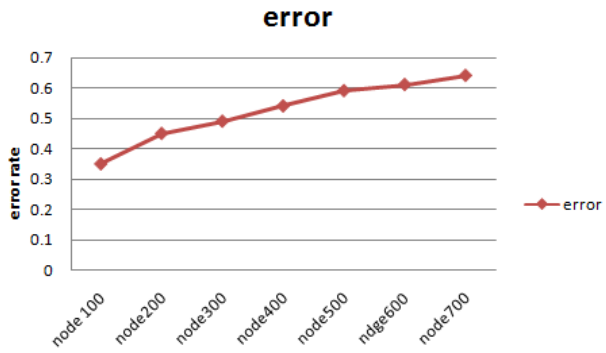
13: Else

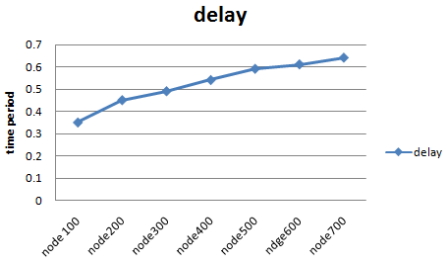
14: pi,j ← pi,j + 0 ,15: ri,j ← ri,j + 1== mesg not receive

III. RESULT

We proposed method using less number of nodes and manage the data sending for RF area and less number of nodes only activated so sensor node use less energy and send node secure and without time delay .

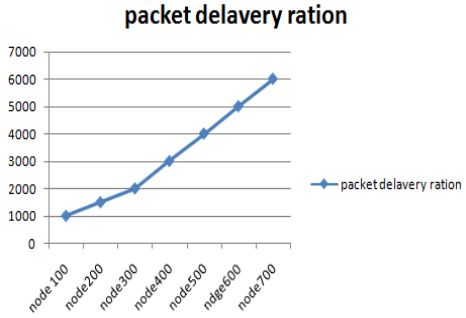
Below table show the error rate and time period for data delivery in no of nodes





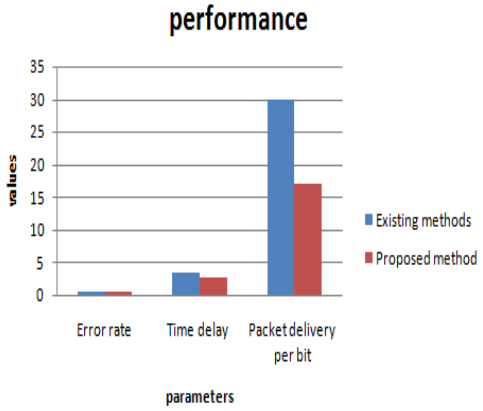
packet delivery ration

node 100	1000
node200	1500
node300	2000
node400	3000
node500	4000
ndge600	5000
node700	6000



The overall performance of existing algorithm and proposed method

Parameters	Existing methods	Proposed method
Error rate	0.56	0.38
Time delay	3.4	2.6
Packet delivery per bit	30	17



IV.CONCLUSION

Reliable and efficient WSN is the need of the today's communication technology and has been able to capture the attention of several researchers. The dual mode working of the sensor nodes in the WSN has been able to reduce the delay. The lifetime is improved by not eliminating the nodes directly when then goes in the isolation state. Energy of the node being one of the several important factors, has to be worked upon by monitoring and with the help of the knowledge acquired by the survey. It also motivates to consider the mobile nodes and not just the stationary nodes and we can improve the computational power by optimal sensor deployment in wireless sensor network. Additionally proposed work managed to implement the resource in the presence of faulty nodes in the network. The comparison with the existing system is also mentioned.

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