ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

**International Journal of Innovative Research in Computer and Communication Engineering**

*(An ISO 3297: 2007 Certified Organization)*

*Website: www.ijircce.com*

**Vol. 5, Issue 6, June 2017**

# Energy Efficient Reliable Data Dissemination in Mobile Coordinated WSN

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**ABSTRACT:** This paper presents the concept of mobile access coordinated wireless sensor network (MC-WSN) — a novel vitality productive plan for time-delicate applications. In conventional sensor networks with mobile access points (SENMA), the mobile access points (MAs) cross the system to gather data straightforwardly from person sensors. While improving the directing procedure, a noteworthy confinement with SENMA is that information transmission is restricted by the physical speed of the MAs and their direction length, bringing about low throughput and huge delay. Our proposed work outperforms the existing one in terms of energy efficiency as Base nodes are only active while transferring data to neighboring node. MA's collect data only from active base nodes. The proposed algorithm finds the transmission energy between the nodes relative to the distance and the performance of the algorithm is analyzed between two metrics Total Transmission energy of a route and Maximum Number of Hops. The proposed algorithm shows efficient energy utilization and increased network lifetime with total transmission energy metric.

**KEYWORDS**: Mobile access, Base nodes, Base stations-hop network.

## I. INTRODUCTION

Remote sensor organize (WSN) has been recognized as a key innovation in green correspondences, because of its irreplaceable part in both regular citizen and military applications, for example, observation, reconnaissance, ecological checking, crisis reaction, shrewd transportation, what's more, target following. Alongside late advances in remote control advances, Unmanned Aerial Vehicles (UAVs) have been used in remote sensor systems for information accumulation [1], [2], and for sensor administration furthermore, organize coordination. Organize organization through UAV has likewise been investigated in writing [3], [4] For productive and dependable correspondence over large-scale systems, sensor connect with portable get to focuses (SENMA) was proposed in [1]. In SENMA, the versatile get to focuses (MAs) navigate the system to gather the detecting data straightforwardly from the sensor hubs.

Nodes in MCWSN have limited battery power . To prolong or maximize the network lifetime these batteries should be used efficiently. The energy consumption of each node varies according to its communication state: transmitting, receiving, listening or sleeping modes. Researchers and industries both are working on the mechanism to prolong the lifetime of the node's battery. But routing algorithms plays an important role in energy efficiency because routing algorithm will decide which node has to be selected for communication.

The main purpose of energy efficient algorithm is to maximize the network lifetime. These algorithms are not just related to maximize the total energy consumption of the route but also to maximize the life time of each node in the network to increase the network lifetime. Energy efficient algorithms can be based on the two metrics: i) Minimizing total transmission energy ii) maximizing network lifetime. The first metric focuses on the total transmission energy used to send the packets from source to destination by using KNN Algorithm. KNN algorithm find the nearest node which is having more capacity to store data. Second metric focuses on the residual batter energy level of entire network or individual battery energy of a node [1].

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## II. Related work

In [2] authors used average residual battery level of the entire network and it was calculated by adding two fields to the RREQ packet header of a on-demand routing algorithm i) average residual battery energy of the nodes on the path ii) number of hops that the RREQ packet has passed through. According to their equation retransmission time is proportional to residual battery energy. Those nodes having more battery energy than the average energy will be selected because its retransmission time will be less. Small hop count is selected at the stage when most of the nodes have same retransmission time. Individual battery power of a node is considered as a metric to prolong the network lifetime in [3]. Authors used an optimization function which considers nature of the packet, size of the packet and distance between the nodes, number of hops and transmission time are also considered for optimization. In [ 4] initial population for Genetic Algorithm has been computed from the multicast group which has a set of paths from source to destination and the calculated lifetime of each path. Lifetime of the path is used as a fitness function. Fitness function will select the highest chromosomes which is having highest lifetime. Cross over and mutation operators are used to enhance the selection. In [5] authors improved AODV protocol by implementing a balanced energy consumption idea into route discovery process. RREQ message will be forwarded when the nodes have sufficient amount of energy to transmit the message otherwise message will be dropped. This condition will be checked with threshold value which is dynamically changing. It allows a node with over used battery to refuse to route the traffic in order to prolong the network life. In [6] Authors had modified the route table of AODV adding power factor field. Only active nodes can take part in rout selection and remaining nodes can be idle. The lifetime of a node is calculated and transmitted along with Hello packets. In [7] authors considered the individual battery power of the node and number of hops, as the large number of hops will help in reducing the range of the transmission power. Route discovery has been done in the same way as being done in on-demand routing algorithms. After packet has been reached to the destination, destination will wait for time δt and collects all the packets. After time δt it calls the optimization function to select the path and send RREP. Optimization function uses the individual node's battery energy; if node is having low energy level then optimization function will not use that node.

## III. Proposed algorithm

```
proc KNN {} {

for {set i 0} {$i < $val(nn) } { incr i }
{
   for{set n 0<= BO<=19}
    {
        set data 250Kpbs
        set frequency 2.4Ghz
        BI = Transmitter * 2^BO
        SD = Receiver * 2^SO
        Node->send->TX
        Node->Receive->RX
        Node->Spath->ivalue->jvalue
        Node1->Spathn+->nth value
    }
}
}
```

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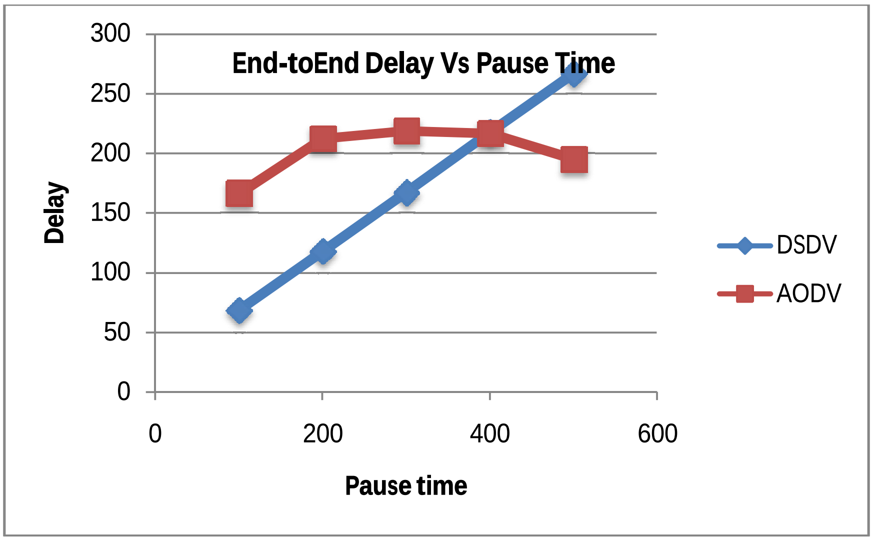
## IV. PSEUDO CODE

Step Algorithm 1 Pseudo code of propose system is,
Input: V = Set of all nodes
Initialize energy to each node of V Calculate energy of each node
Calculate distance to the neighboring node and to the base station Compare energy and distance of all nodes
Select maximum energy and minimum distance node
Output: CH = node who's having maximum energy and minimum distance to base station

```
Algorithm 2: Optimize use of Energy of sensor / base nodes
Input V: Energy of node N
    If (data available to sense) then
        Select active mode /state sense data
        Check if (capacity to store >= MAX capacity) then
                Find neighboring node
                Pass data sensed for temp storage
            Else
            Pass data to CH
            Get back to idle state
 Else
  Be in idle/sleep state
```

**Simulation Results**

**End To End Delay:**




 DOI: 10.15680/IJIRCCE.2017. 0506187 

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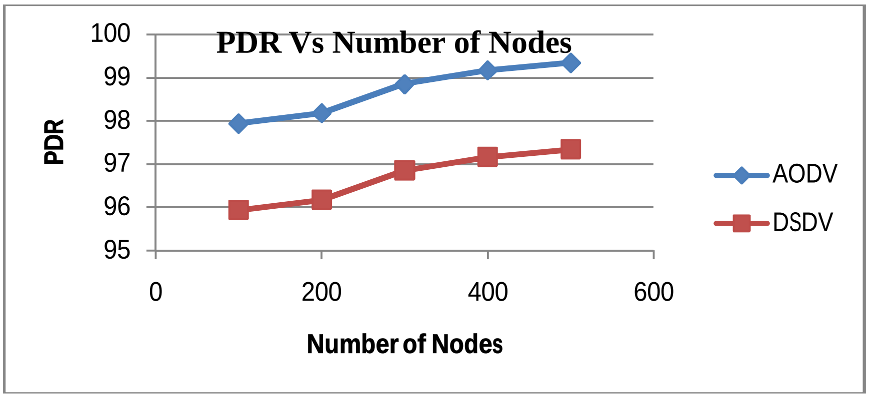
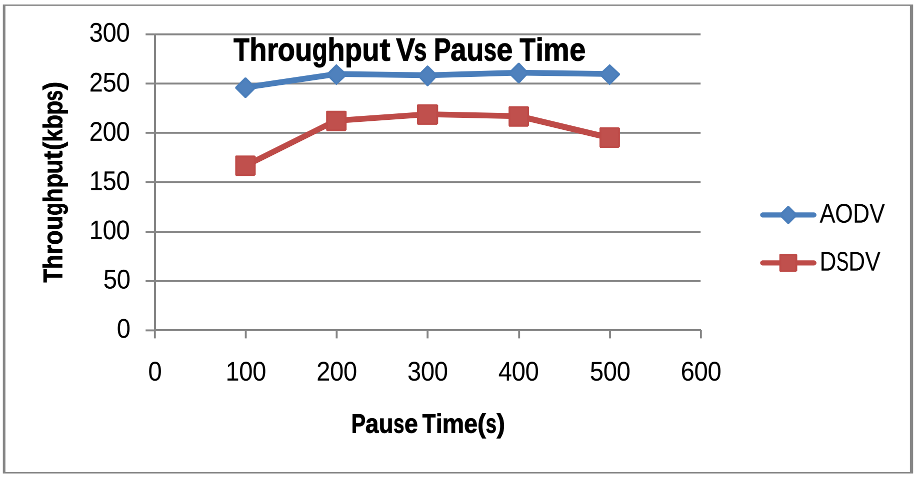
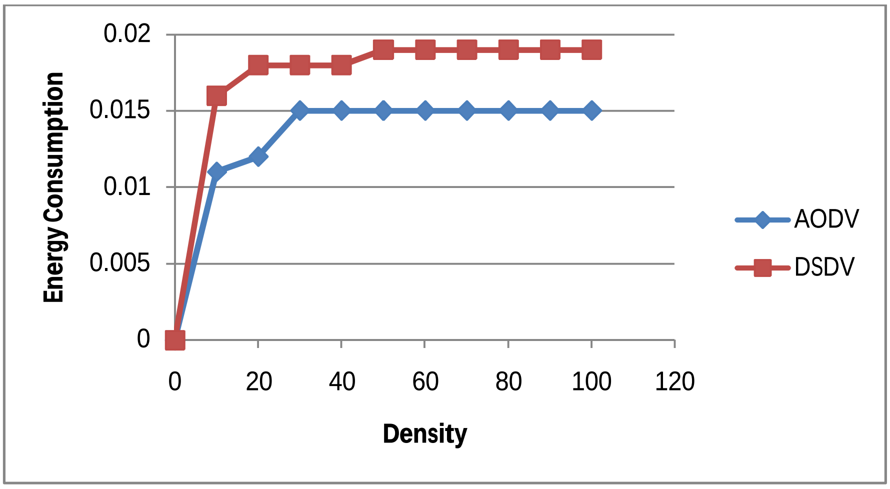
**Packet Delivery Ratio:**




**Throughput:**




**Energy Consumption**



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## IV. CONCLUSION AND FUTURE WORK

The simulation results showed that the proposed algorithm performs better with the total transmission energy metric than the maximum number of hops metric. The proposed algorithm provides energy efficient path for data transmission and maximizes the lifetime of entire network. Proposed algorithm find the shortest path between sensor nodes those which are active state and then passes the data to mobile Access point and then it passes to base station. Using this algorithm we get the high throughput because delay is less as well as we can reduce the energy of the sensor nodes.

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**Vol. 5, Issue 6, June 2017**

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