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# Energy balanced Sleep Scheduling based OLSR Protocol for WMNSN

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***Abstract***
1) ***With developments of energy harvesting technologies, rechargeable Wireless Sensor Networks (WSNs) are increasing. Network-wide connectivity is not guaranteed in rechargeable WSNs, since the temporally dead status of a critical node may result in the partition of the whole network.***
2) ***Sleep scheduling strategy should be still applied to allow sensor nodes to get enough time to recharge energy. In this paper, an energy balanced sleep scheduling scheme (EBSSS) is applied, which takes nodes' residual energy as the parameter to dynamically decide nodes to be active or asleep.***
3) ***On top of this, the challenging issue is: how to design an efficient geographic node-disjoint multi-path routing algorithm which allows higher sleep rate in the network. This paper introduces a novel routing algorithm OLSR, in which a forwarding node chooses the next-hop node based on 2hop.***
4) ***Keywords: WMNSN, OLSR, Sleep scheduling.***

***Objectives:***
a) ***To reduce the bottleneck problem using piezoelectric nano energy harvesting system***
b) ***To select a best shortest path using energy balanced sleep scheduling with optimized link state routing protocol Minimizing the average end to end delay, maximizing the network life time ,and maximizing the packet delivery ratio.***
c) ***Based on above analysis an energy harvesting multipath routing is proposed .the network uses piezoelectric energy harvesting system is used to reduce the bottle neck problem that is limited energy stored in a nodes ,***

## I. INTRODUCTION

Rapid develop in nano technology, multimedia nano devices like nano camera, nano processor, nano sensor, nano memory are beginning to emerge. Wireless multimedia nano sensor is a new sensor network developed on this basis, which combines nano technology and multimedia technology. But very limited energy stored in nano sensor .Energy harvesting multi path routing (EHMR) is proposed the simulation result shows that the EHMR protocol ensures the self power nano nodes to work permanently. Thus it is suitable for WMNSN with high QoS requirements

### *A. Existing System*

1) The existing system used energy harvesting multipath routing based greedy algorithm.
2) Also it uses piezo electric energy harvesting system. Trough piezoelectric energy harvesting system, all the nano nodes are able to collect energy from the environment and the energy of nano control nodes is not limited.
3) Greedy algorithm is used to select nano nodes path by giving inputs to each nodes. Also it select the cluster head in each nodes .

### *B. Limitations*

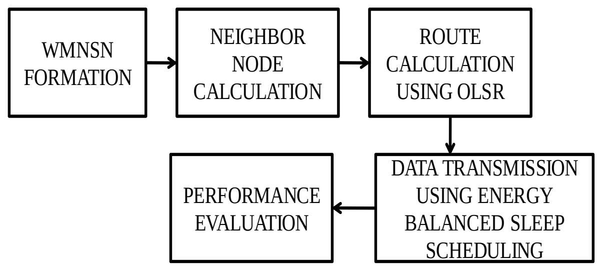
1) High delay for selection of cluster head
2) Data loss due to link error

### C. Proposed system

1) Energy balanced sleep scheduling based optimized link state routing protocol
2) First, this routing framework is based on hierarchical cluster-based architecture where the WMNSN is partitioned into clusters.
3) Within each cluster, a nano-controller, which is a nano device with more advanced capabilities than a nanosensor, coordinates the nanosensors and gathers the data they communicate.
4) This hierarchical cluster-based architecture is specifically devised to manage most of the complexity of any network protocol or algorithm at the nano-controller, and to cope with the limited resources of the nanosensors.

5) Moreover, since the communication within the nanosensor network involves high bit-rate transmissions in the Terahertz Band, the nanocontroller is also responsible to guarantee the necessary synchronization at the physical layer.

# BLOCK DIAGRAM




## *D. Sensor Network Classification*

On the basis of the sensor network modes of. functioning and target application type, a simple. classification can be prescribed [4]

1) *Proactive Networks:* This type of network is used when a periodic data monitoring is required. It provides a data processing (sensing, analysis, transmitting) at regular intervals.
2) *Reactive Networks:* The nodes have a sudden react and a drastic change after receiving the value of sensed attributes. This scheme is well suited for critical timing applications.

## *E. Energy Model*

As discussed above, energy efficiency is the most important issue and researchers have made different types of assumption about radio characteristics which includes energy dissipation in transmission and reception. [16]. A previous energy model [17], [18] is discussed here. This model states, consumed energy in transmitting a message of k bits size over a transmission distance d is given by,

$$Etx\ (k,d) = k(Eelec+\varepsilon ampd\lambda\ )$$
$$=kEelec + \varepsilon ampkd\lambda$$

Where, k=length of the messaged= transmission distance between transmitter and receiverEelec= electronic energyεamp= transmitter amplifierλ= path- loss component ($2 \le \lambda \le 4$)Also, the energy consumed in the message reception is given by, Erx= Eeleck. Therefore, the total energy consumed to ransmit and received by another sensor is,

Etotal(d) = k( 2Eelec + εdλ)EHMR ROUTING ALGORITHM

EHMR is a kind of on demand routing ,and it establish multi hop routing only when the source node needs to transmit data. So there is no need to maintain network topology information thus reducing the routing over head.

Game routing model

Self powered WMNSN routing protocol is designed to maximizing the performance if the network.

U(pi)=au1(pi) + bu2(pi) + cu3(pi) du4(pi)

Pi= path =(v1,v2, v3,……vn)

The signal received by a nanosensorj can be written as:

$s^j_R\ (t) = A^u_k p\ (t - kT_s - \tau^u) * h^{u,j}\ (t) + w_k^{u,j}\ (t)$ (2)k=1

where $h^{u,j}(t)$ is the Terahertz channel impulse response between the nanosensorsu and j , *F. Medium Sharing with TS-OOK.*

Multiple users can share the channel when using T S- OOK. Due to the fact that the time between t ransmissions$T_s$ is much longer than the pulse duration $T_p$, several nanosensors can concurrently use the channel without affecting each other. In light of the type of applications envisioned for WNSNs, we think of a scenario in which nano- devices can start transmitting at any specific time without being synchronized or controlled by any type of network central entity. The traffic in WNSNs is predictably low, but it can drastically increase at specific times due to correlated detections in several nanosensors.

In contrast to IR-UWB [7], time-hopping orthogonal se-quences are not considered. In TS-OOK, the probability of having a collision between femtosecond -long pulses is very low. Moreover, not all types of collisions are *harmful*. For ex-ample, there are no collisions between silences, and collisions between pulses and silences are only harmful from the silence perspective, i.e., the intended receiver for the pulse will not notice any difference if silence is received at the same time. In any case, collisions may occur, creating multi-user interference and thus limiting the capacity of this communication scheme.

In the multi-user case, the signal received by a nanosensorj is given by:

$$!s^j_R (t) = \quad A^u{}_k p (t - kT_s - \tau^u) * h^{u,j} (t) + w_k{}^{u,j} (t)$$

u=1 k=1

(where U is the total number of users in the system, K is the number of bits (symbols) per packet

*1)* Advantages

*a)* Improves the energy harvesting of WMNSN

*b)* Reduces delay and improve the transmission rate.

*c)* Improves the network lifetime.

*d)* Large data transmission.

## II. CONCLUSION

The energy balanced sleep scheduling scheme will be applied in this paper. End to end delay, packet losses is also reduced. Energy is also saved in nano nodes and shortest path will be find by OLSR.

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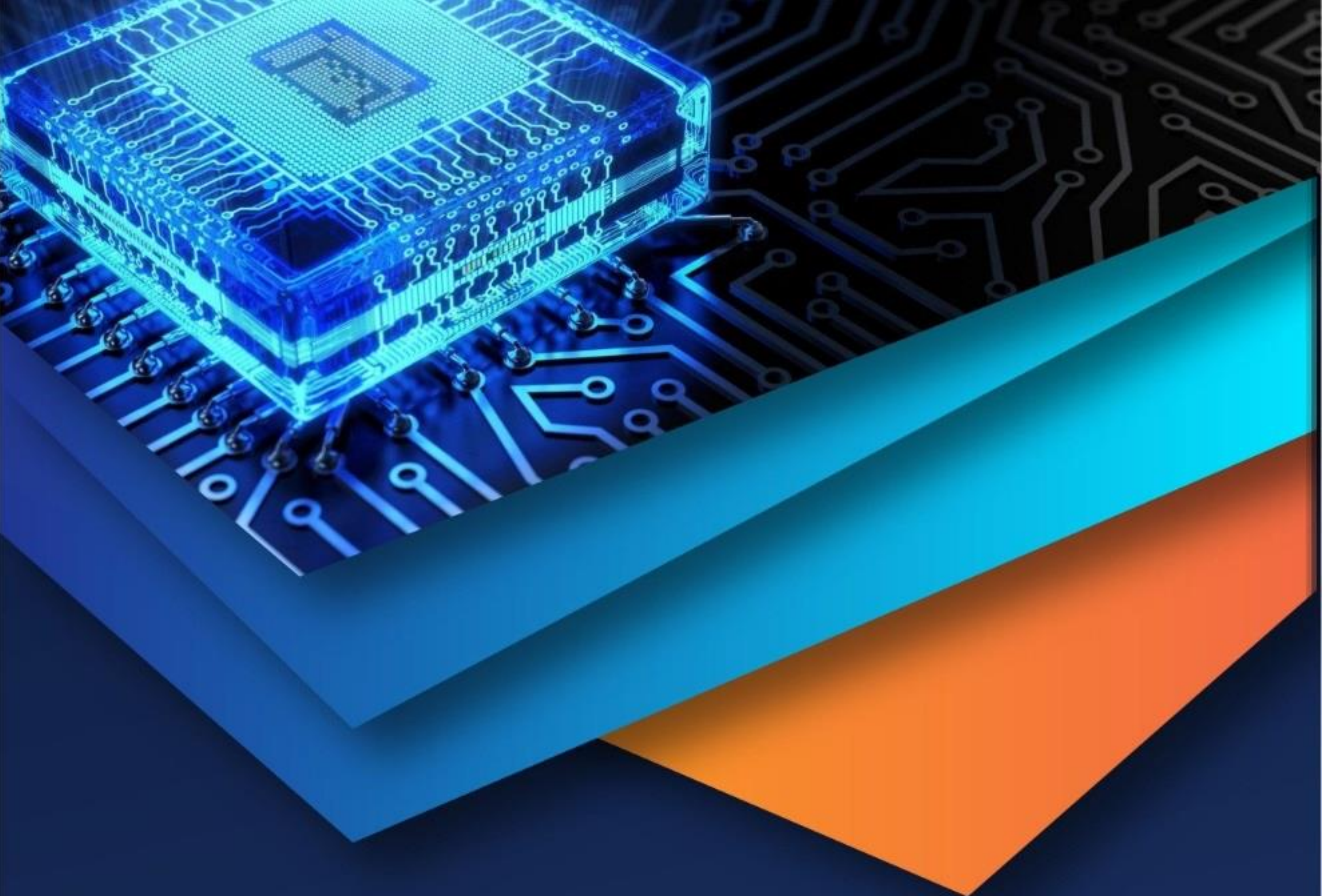

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