A Review On Energy Efficient Transmission Approach For WBAN Based on Threshold distance

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Abstract - *It is a familiar fact that conservation and preservation of network energy is one of the primary objectives of the sensor nodes in a wireless sensor network. This becomes even more important when we are talking about Wireless Body Area Network (WBAN). In this case, the sensor nodes are working either very close to or inside a human body. Hence performance is a very important task here. In this project we aim to reduce the consumption of energy while a transmission is made. We tend to strategically toggle between working/non-working status of a sensor node while it is being involved or not involved in the transmission process. We are able to increase the network time by a very good amount. Other deceptive parameters are also to be calculated.*

Key Words: Sensor Nodes, Energy Efficiency, Wireless Body Area Network,

1. INTRODUCTION

Wireless body area networks (WBANs) are emerging as one of the newest forms of Wireless Sensor Networks. In WBANs, sensor nodes accumulate human physiological data and transmit it to the sink node [1]. However, transmission of physiological data to the sink node over a mobile route becomes a very daunting task for sensors due to their limited battery power. Moreover, replacement of critical sensor nodes is a major challenge in such scenarios. In order to increase network lifetime, some routing protocols have been proposed in the literature, but the majority of them are focused on coverage distance and residual energy of sensor nodes. In this work, we will propose an energy efficient routing algorithm for WBANs [3].

Wireless Body Area Network (WBAN) is emerging as one of the most advanced communication networks. WBANs serve a variety of applications including healthcare, personal entertainment, advance sports training, live events, aviation, natural disasters, consumer electronic devices, etc [5]. Sensors in WBANs measure physiological parameters of human body, such as sugar level, temperature, heartbeat, etc., and forward it to the concerned authorities using an intranet/internet facility [2].

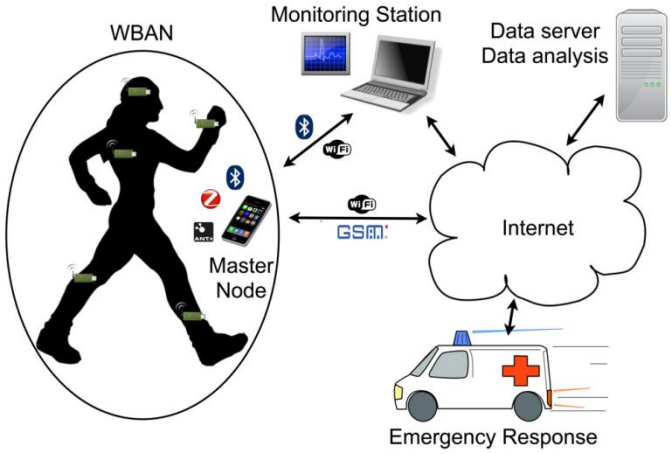

Fig-1: Architecture of WBAN Sensor Network

This kind of continuous monitoring is especially important in critical circumstances such as workers in coal mines and patients with serious medical conditions. The sensors in WBANs can be classified as implant nodes, body surface nodes and external nodes depending according to IEEE 802.15.6 (WBAN) standard, the layered architecture of WBAN consists of Physical and Medium Access Control (MAC) layer which deal with communication. These layers help in establishing energy efficient, highly reliable, cheap and coherent wireless communication in the proximity of the human body [9].

WBAN can be integrated with different wireless technologies like Zig Bee, WSNs, Bluetooth, cellular networks, etc., which will allow expansion of advanced consumer electronics. However, rapid acceleration in the usage of wearable wireless sensor devices expedites the requirement of reliability, security, fault tolerance and quality of service aspect

[10]. However, there are certain factors like different bandwidth channel topological changes, time-varying wireless channel, and variation in channel bandwidth which make WBANs less lucrative [6]. As different types of nodes coexist in WBANs that are scattered in and on the human body, multiple transmission channels are developed between the nodes based on their location. The major goal of a channel model is to evaluate the performance of several physical layer proposals as well as providing a fair comparison amongst them.

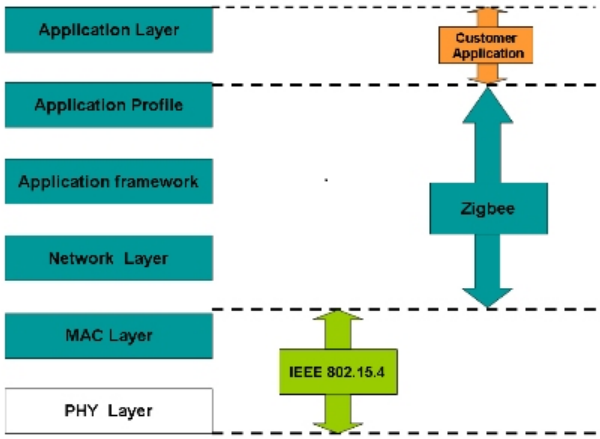

Fig-2: Layered Architecture for WBAN

2. RELATED WORK

S.Kannan [7] has Summarized individual quality of life can be improved by using collection of sensors which can be embedded into the fabric of wearer is called as wearable physiological monitoring system. This system can continuously monitor vital signals and transmit wirelessly to be mote monitoring system. Wireless sensor network can be used in wearable physiological system which has limited availability of energy on network nodes. Clustering can be used to increase lifetime for wireless sensor networks. Energy efficient is possible in wireless sensor network by reselecting cluster heads according to the ratio of residual energy of each node to their distance from base station.

Guangxia Xu, Manman Wang [8] have says an important branch of Wireless Sensor Network (WSN), Wireless Body Area Network (WBAN) has received extensive attention of various fields as it is portable and removable. However, energy consumption is highlighting increasingly as nodes are hard to be recharged or replaced. Up to now, many energy efficient routing algorithms or protocols have been proposed with techniques like clustering, data aggregation and location tracking etc. However, many of them aim to minimize parameters like total energy consumption, latency etc. In order to optimize network routing and prolong the life of network, this paper proposes an energy-efficient routing algorithm in WBAN which is based on Genetic Ant Colony Algorithm (GACA).GACA makes full use of Genetic Algorithm (GA) and Ant Colony Algorithm (CA).

Chenfu Yi, Lili Wang, and Ye Li[11] have summarized Energy efficiency is a key concern for wireless sensor nodes, especially for wireless body area network (WBAN) in which sensors operate in close vicinity to, on or even inside a human body. In this paper, we first present a system-level energy consumption model associated with transmission distance d and transmission data rate over on-body wireless communication link. Then, based on the analysis of tradeoff between circuit energy and transmission energy on distance, a threshold distanced which is responsible for the proportion of transmission energy and circuit energy is derived for energy saving in WBAN. With the case of d = d, since circuit energy is comparable with transmission energy consumption, the total energy consumption can be saved by optimizing the transmission data rate R. Simulation results show that a 59.77% or even more energy saving is achievable using the optimized scheme, compared with baseline scheme. With d>dth, since the total energy consumption is monotonically decreasing with respect to time t, an offline algorithm is applied to energy saving by prolonging transmission time within the deadline time. In addition, on the basis of the offline algorithm, a battery-aware transmission approach is presented for WBAN using battery electrochemical property. Experimental results show that, using the presented battery-aware approach, 71.05% and 60.81% energy saving can be obtained, in comparison with the baseline and offline schemes, respectively.

Sidrah Yousaf, Nadeem Javaid, Umar Qasim, Nabil Alrajeh, Zahoor Ali Khan, and Mansoor Ahmed [4] have analyzed incremental cooperative communication for wireless body area networks

(WBANs) with different numbers of relays. Energy efficiency (EE) and the packet error rate (PER) are investigated for different schemes. We propose a new cooperative communication scheme with three-stage relaying and compare it to existing schemes. Our proposed scheme provides reliable communication with less PER at the cost of surplus energy consumption. Analytical expressions for the EE of the proposed three-stage cooperative communication scheme are also derived, taking into account the effect of PER. Later on, the proposed three-stage incremental cooperation is implemented in a network layer protocol; enhanced incremental cooperative critical data transmission in emergencies for static WBANs (EInCo-CEStat). Extensive simulations are conducted to validate the proposed scheme. Results of incremental relay-based cooperative communication protocols are compared to two existing cooperative routing protocols: cooperative critical data transmission in emergencies for static WBANs (Co-CEStat) and InCo-CEStat. It is observed from the simulation results that incremental relay-based cooperation is more energy efficient than the existing conventional cooperation protocol, Co-CEStat. The results also reveal that EInCo-CEStat proves to be more reliable with less PER and higher throughput than both of the counterpart protocols. However, InCo-CEStathas less throughput with a greater stability period and network lifetime. Due to the availability of more redundant links, EInCo-CEStat achieves a reduced packet drop rate at the cost of increased energy consumption.

3. PROBLEM FORMULATION

Wireless body area sensors are used to monitor human health with energy constraints. Different energy efficient routing schemes are used to forward data from body sensors to medical server. It is important that sensed data of patient reliably forward to medical specialist or server for further analysis. Proposed scheme facilitate mobility at cost of low throughput and high energy conservation. We plan to achieve a longer stability time and high throughput.

The Authors in[15] have says Energy efficiency is a key concern for wireless sensor nodes, especially for wireless body area network (WBAN) in which sensors operate in close vicinity to, on or even inside a human body. In this paper, we first present a system-level energy consumption model associated with transmission distance d and transmission data rate over on-body wireless communication link. Then, based on the analysis of tradeoff between circuit energy and transmission energy on distance, a threshold distanced which is responsible for the proportion of transmission energy and circuit energy is derived for energy saving in WBAN. With the case of d = d, since circuit energy is comparable with transmission energy consumption, the total energy consumption can be saved by optimizing the transmission data rate R.

4. PLANNING OF WORK

Wireless body area network (WBAN) consists of several mobile devices worn on the human body. WBANs have enormous potential in health monitoring systems as it eliminates the inconvenience of having wires around the patient's body, offering more freedom of movement and comfort, enhanced monitoring, and the administration of at-home treatment. Low power consumption is crucial for such applications due to the limited capacity of portable batteries. The power consumption of wireless communication is especially important since the radio typically consumes the majority of the energy in such systems. In this project, we plan to reduce this energy consumption by strategically enabling the nodes to be working or non-working. We plan to keep only those nodes switched on, which take part in the communication process.

5. CONCLUSION

In this paper we discussed about various Authors and their thought. For Energy Efficient Transmission Approach For WBAN we can consider a network where 1 or multiple nodes are mobile. In that case, due to continuous routing, energy conservation could be difficult. So we can try to work around this problem where either the sink, source or multiple nodes are continuously moving.

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