

WIRELESS SENSOR NETWORK FOR MOBILE HEALTHCARE SYSTEM: ISSUES SURVEY

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ABSTRACT:

By utilizing the advance, recent technologies to improve and archive better health monitoring. Health monitoring is the new technology has been potentially to offers wide range of benefits to the patients such as continuous monitoring, early detection of abnormal conditions. A discussion is about issues and their solutions for improving healthcare system. Healthcare system still facing the challenges such as reliability, security and privacy, lack of resource sharing and computing process. With the pervasiveness of smart phone and wearable sensor nodes are extends the operations of healthcare providers in the pervasive environment. This paper discusses the implementing issues in healthcare system while patients in emergency conditions. This is suitable only for the particular environment. In future it will be globalize for improving healthcare for life-threatening situation.

Key words: healthcare system, pervasive environment, globalize.

I INTRODUCTION

Healthcare system is an important application using pervasive (i.e., wide spread throughout environment) computing to improve healthcare quality and save lives. In the healthcare system environment the medical users are equipped (as per the chronic condition) with implantable or

wearable sensors in their body then it will form the body sensor network [1]. After that the sensed personal health information (PHI) will be aggregated through the mobile devices (gateway of sensor node) and transfer it into the particular healthcare center via 3G network. Based on the PHI data, medical professionals at healthcare center can continuously monitor medical users' health conditions. If any emergency conditions occurs, immediately dispatching the ambulance or medical professionals to an emergency location in timely manner.

Although the healthcare system is benefit medical users by providing high-quality of pervasive healthcare monitoring we fully understand and manage the challenges in healthcare system especially in emergency condition. To clearly illustrate the emergency condition consider the following scenario. In healthcare system normally BSN sense the data and will report to healthcare center every 5 minutes. When emergency situation happen the sensor nodes are busy to reading PHI date and it will report the data to center every 10 seconds. The main issue is focusing in the followings. The large amount of data are generated in short time the gateway of sensor node have the discipline to send all the data but using the smartphone facility the large amount of high intensive data will not sufficient for report to

healthcare system. Although this kind of unexpected condition will may happen with low probability. But smartphone facility is given high mobility condition for the medical users, users can walk outside and receive high quality healthcare monitoring anywhere and anytime. The following will be discusses about what will be do in this condition? And find their solutions by using various advanced technologies.

II RELATED WORKS

1. Resource Sharing Management

As per the above mentioned situation the smartphone is not sufficient to transmit when emergency condition occurs i.e., the large amount high intensive data will be slow down the processor in the node. In this condition we have to utilize the other node resources for report the PHI data in timely manner. The PHI data will be distributed to all available node and process it will be collected by the healthcare center. In this condition the every node ,process some particular work as we fixed. It will Clearly describe in following example. We already mentioned the BSN were formed as per the chronic conditions by the medical user I.e., the diabetic patients have some attributes for sensing the data which is not may present in the heart disease patient. As per their conditions the software were installed in their smartphone. The diabetic patient's data are not aggregate by heart disease patient. So we have to find the similar symptoms medical users node using data mining concepts in the environment and sharing or utilize the resources from other medical user who are not in the same condition. After finding the medical user find the threshold value and distribute the PHI data to aggregate and then reported to the healthcare center. In this system the medical users are only welcomed to participate in the computation other are not welcomed.

2. Similar Symptom Profile Matching

We have easily said find the similar symptoms user in the environment and distribute the data. In practical it is not easy to find the similar symptoms nodes in the environment. To overcome this problem, all users should be connected in the mobile social network and every users will create own profile for healthcare system. Using the pervasive computing technology we can easily find the similar symptoms users and able to participate in the computation. According to using data mining concept we make the cluster formation for separating the medical and non medical user and also medical user who have the similar attributes are inter connection and dissimilar have intra connection. Making new connection according to this condition is a crucial service in mobile social networking, where any user can find similar symptoms matching user within physical proximity.

Privacy preserving personal profile matching[2] technique is used to find the similar symptoms user with high privacy. One could find the user's profile only other private or personal data are hide by this technology. In the network how will we find the secure user in the network? The raw data were published to other user is not possible because the security become lack in this module. To provide high security in every data sharing ,It will going to take cryptography encryption technique for data sharing. In healthcare system it using the Homomorphic encryption technique[3] for secure friend discovery for sharing the data. In Healthcare system the every medical user have the session key and access control key for generate the session data and access other medical user respectively. Every BSN will generate data and encrypted then transmit to the gateway node using Bluetooth or wi-fi network. Then it will decrypted by mobile device, it will create the session with particular user ID. In the

network, access control key is used for finding the secure medical user for distribute the resources.

3. Scalar Product Computation

After sharing the resources to similar symptom medical user, then received user will transmit the other's PHI data through their devices. In this condition the every node will receive or communicate with other node when it will become free. But in this system every medical user are conditioned to monitoring continuously. In this situation every node have the power of scalar product computation process. How to said the system will be reliable ? when we take into 1000 emergency cases in consideration, the average 50 event will not be negligible this explicit indicate the reliability of healthcare system.

Scalar product computation is the process of computing the similar values in one data. Lets consider U1 medical user have the n no of attributes as $\vec{a}=a_1,a_2,\dots,a_n$ and U2 user have attributes as $\vec{b}=b_1,b_2,\dots,b_n$. Using the scalar product computation the result will be as followings.

$$\vec{a} \cdot \vec{b} = \sum_{i=1}^n a_i \cdot b_i$$

The above equations show the collaboration between two users PHI data generation. This computation will process only when raw data value receive from the user. In this system the user does not want to share their personal raw data to the others. It will become the lack of privacy and the security is not concerned. So the every PHI data will de securely shared to other user.

4. Privacy Preserving Scalar Product Protocol

In wireless sensor network every data are considered as the sensitive data information, it will be transmit in high secure manner. The traditional routing protocols have the leaking problem is not able to transmit the high intensive data. So we use the separate protocol for transmitting the data to the healthcare center which have secure as well as it is none other than privacy preserving scalar product protocol[4]. The goal of the protocol is get the $a \cdot b + v$ where v is random number and is unknown to other medical user. Based on the privacy preserving data mining technology it finds the similar symptom medical user in large amount of data sets as well as compute the scalar product computation.

5. Opportunistic Computing

In this system the main problem has been occur while high intensive data transmission in the single node. To overcome this problem using the opportunistic computing [5] technique to solve the problem, opportunistic computing is a recently proposed technique for pervasive computing and avail the resource available in single node as well as opportunistically leverage of other node's resource. In opportunistic computing networking, nodes avail the available resources in the environment. Here we focus on computational resources (mobile nodes invoke service on each other) for computing the scalar product. it use the store and forwarded method to overcome the problem of executing application when the size of the program is larger than the amount of memory available on the single node. In the healthcare system the amount of memory exceeded in single node is denoted as main problem in this system. To overcome this problem we use the compression technique for forwarding the data. If the same problem may happens discussed technique will be follow in the system. It mainly uses the routing technique [6] such as context oblivious,

partially context aware and fully context aware. It is based on the amount of knowledge about the context of user exploits.

III CONCLUSION

In this paper we have discussed about the main problem in mobile healthcare emergency and facing their related challenges in the environment. Scalar product computation improve the reliability in this system, the secure scalar product computing protocol defines the Homomorphic encryption technique and privacy preserving for the PHI data transmission. Opportunistic computing describes the resource sharing management and also utilizes avail of single node resources in the system.

IV REFERENCES

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