

## WSN Technologies in Designing a Telemedicine Network

Fatemeh Rabeifar (PhD)<sup>1\*</sup>

**Dear Editor,**

A wireless sensor network is a network that consists of a large number of small nodes. In each node, there are a number of sensors that interact with the environment and measure features such as humidity, pressure and etc. The information can be taken from the environment through these sensors. The sensor networks are used to obtain the health status of patients and medical services. Sensor networks often involve the implementation of a number of sensors such as object detection, the effective and efficient energy-saving cluster-forming algorithm for intelligent patient control and smart E-Health, and power usage with low to high power management Technique for Rapid Communication and Routing Systems battery lifetime consumed [1]. It is also very critical in treating health status of the patient that is given the numerous utilities of telemedicine we need to create a proper structure to provide medical services effectively as much as possible; so, taking advantage of both information technology properly and information technology management process will let us start designing and implementing such health systems [2]. We have wide objects with a unique address. These objects have a virtual identity and personality and they can communicate with each other with the help of the intermediaries that are defined for them, and provide services to the outside world and human beings while serving each other [3]. Low energy connections in the physical layer and media access control layer in telemedicine network supported by IEEE 802.15.4. Routing in the 6lowpan environment is supported by the routing protocol for low-power networks (RPL) [3,4].

In addition to being a routing protocol, this protocol provides a framework that prepares specific needs of the domain. Now special profiles, to specify the requirements related to routing and optimization goals are defined [3,5]. The routing protocol of networks is a protocol for routing on low-power networks such as the internet of things (IoT) and wireless sensor networks, which is currently being advanced by the IPV6 expands the concept of IoT, companies are trying to find ways to use devices or physical objects using the 6lowpan compliance layer directly to cloud computing systems [1,4].

### **different IoT technologies for Telemedicine:**

- WSN
- RFID [5]

<sup>1</sup>Department of Computer Engineering, Shahr-e-Qods Branch, Islamic Azad University, Tehran, Iran

\*Corresponding author:  
Fatemeh Rabeifar  
Department of Computer Engineering, Shahr-e-Qods Branch, Islamic Azad University, Tehran, Iran  
E-mail:  
rabeifar.f@gmail.com

Received: 23 November 2024  
Accepted: 11 December 2024

- IoT Communication Protocol
- Sensors in Telemedicine
- Patient Monitoring Devices
- Web-based services

#### **WSN technologies for Telemedicine:**

- 1) Patient Wearable Monitoring such as Biomedical Sensors
  - 1-1) Position Sensors
  - 1-2) Hospital Patient Monitoring
- 2) Data Aggregation & Dissemination
- 3) Data Fusion

RFID and WSN technology provide a means for communication and a network infrastructure. The health status is checked by RFID sensors in wireless networks. Sensors gather data from sensor networks and generate both biological and behavioral information [5,6]. Wireless sets need to work independent of the internet, especially since there would be times when the connection between a wireless system or a network with the internet is broken. During such periods of time, wireless systems need to be able to work sustainably while there is no connection between them and the remaining structure. Majorly, they need to be able to form local ad hoc networks using their internal network protocols. Therefore, certain issues such as identity request confirmation and synchronization of the status must be considered exactly and with the least system's delay [2,4,5]. By applying this technology, it is possible to assign a digital identifier. Providing people with welfare and comfort and also improving the quality of patient care via telemedicine database are the main goals for improving and upgrading this issue.

#### **Conflict of Interest**

None

#### **References**

1. Sadiq BO, Zakariyya OS, Buhari MD, Shuaibu AN. Maximizing network capacity, control and management in designing a Telemedicine network: a review and recent challenges. *Nigerian Journal of Technology*. 2024;**43**(1):80-100. doi: 10.4314/njt.v43i1.11.
2. Rabeifar F. Wireless Sensor Networks in Progress of Smart E-Health and Cloud Computation Era. *J Biomed Phys Eng*. 2023;**13**(5):495-6. doi: 10.31661/jbpe.v0i0.2307-1637. PubMed PMID: 37868941. PubMed PMCID: PMC10589687.
3. Liu YF, Chang TH, Hong M, Wu Z, Man-Cho So A, Jorswieck EA, Yu W. A survey of advances in optimization methods for wireless communication system design [Internet]. arXiv [Preprint]. 2024 [cited 2024 Jan 22]: 6 p. Available from: <https://arxiv.org/abs/2401.12025>.
4. Li C, Zheng J, Zhang X, Luo L, Chu G, Zhao J, et al. Telemedicine network latency management system in 5G telesurgery: a feasibility and effectiveness study. *Surg Endosc*. 2024;**38**(3):1592-9. doi: 10.1007/s00464-023-10585-x. PubMed PMID: 38148405.
5. Rabeifar F, Radfar R, Toloie Eshlaghy A. Cloud Robotic for Development of Smart Telemedicine. *J Biomed Phys Eng*. 2022;**12**(3):225-6. doi: 10.31661/jbpe.v0i0.2202-1465. PubMed PMID: 35698537. PubMed PMCID: PMC9175123.
6. Rabeifar F, Radfar R, Toloie Eshlaghy A. Security in Telemedicine based IoT. *Health Man & Info Sci*. 2021;**8**(3):200-9. doi: 10.30476/jhmi.2022.92061.1091.