

# Chapter 4

## Distributed Deep Learning for Smart IoMT Challenges in the Healthcare Domain

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### **ABSTRACT**

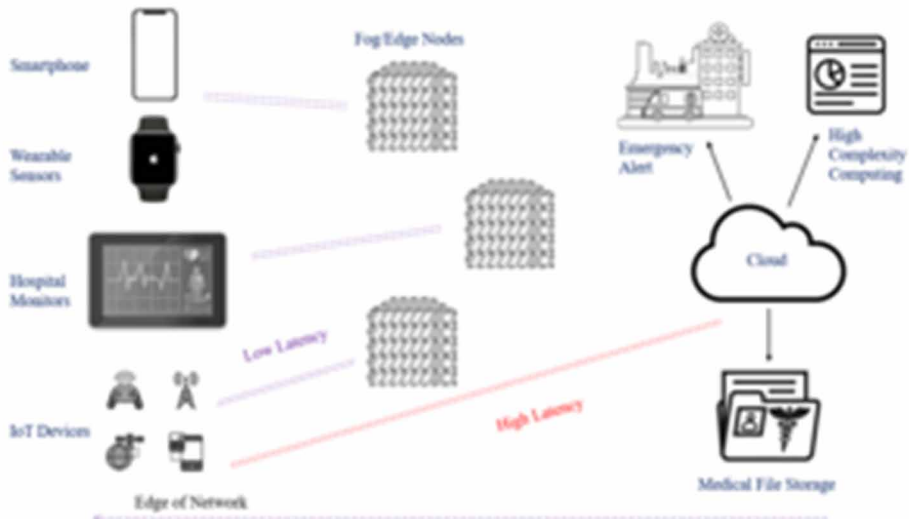
*The Internet of Medical Things (IoMT) collects and transfers healthcare data over the network using sensors, software applications, and Edge devices. A greater number of Healthcare devices are being manufactured and there are various challenges like Interoperability, Security, Scalability, and privacy. IoMT devices are used to monitor and deliver treatments to patients remotely. For IoMT devices to reach their full potential the challenges need to be addressed. Healthcare devices when compromised can harm patients by disrupting personal data.*

### **INTRODUCTION**

Digital healthcare products like fitness trackers, heart monitors, etc., which record real-time and biometric data are the clearest area of excitement now and in the future. Sustainable Digital healthcare shall transform society digitally by providing a faster response for emergency, and acute care and also reducing the amount of energy which in turn will reduce the carbon footprint of the server farm. Latency and Cyber security are the most dangerous challenges in IoMT devices. The classic security mechanisms in IoMT are provided by encryption, multifactor authentication, etc., which require more energy because of the longer bit length and are stored in a device that could be compromised. A lightweight technique that is both energy efficient and does not require the storing of encryption keys is ideally suited for a highly secure and energy efficient IoMT.

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*Figure 1. Outline of latency from healthcare devices to server*



## **ADVANCEMENT IN HEALTHCARE COMPUTING**

This segment examines the fundamentals of computing in the healthcare domain as well as the catalyst which took computing towards a distributed architecture from a centralized cloud, which paved the way for the foundation for edge computing and fog computing. The specific point of reference for pioneering digital healthcare regarding price, use of less energy, and quality of experience are also examined.

### **Healthcare Application Types**

Healthcare applications can be classified into various types by the type of device, data, or unique use case. The following are the primary healthcare classifications based on use cases:

- Monitoring health in Real-Time
- Emergency Management Systems
- Information Dissemination in Healthcare
- Health-aware Edge Devices

Multiple platforms can be used for real-time health monitoring at the same time. Observation of the body's most basic functions like heartbeat, blood pressure, and temperature can be processed on Edge devices, and wearable sensors or can be

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