An overview: 5g Technology using in health monitoring system

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Abstract: Focused on the information about 5G network issued by various organizations and mobile communication technologies , this paper give an overview of an application in direction of 5G wireless technology and introduces the high speed large-scale antenna technology and ultra-dense networking technology, as well as the application scenarios in health monitoring with the help of mobile communication.

Index Terms **- 5G mobile communication network; monitoring sensor; Large scale antenna technology; ultra-dense networking ; 5G K-Simulator.**

I. INTRODUCTION

A 5G K-Simulator consisting of a link-level simulator (5G K-SimLink. The 5G K-Simulator is to solve the waste of human and material resources consumed in simulator development in the continuous management and performance analysis of wireless communication technology. The code of the 5G K-Simulator is developed with a modular and flexible methodology that allows users to more easily use. The monitoring sensor are the sensors with smallest physical devices with extra features to be implemented with the 5g technology. The reliability achievement of the monitoring sensor can be done with the 5g technology. The combination of monitoring sensor and 5g technology in the world of health can give extremely good results. There are certain devices that are associated with touch and wearable devices that are available in the health monitoring but with respect to the 5g technology's make it faster and more accurate. This sensor device is a wearable e.g small earplug ,smart band sensors that could improve monitoring of vital signs, with the aim of monitoring heart, brain ,lung and check diabetic functions for health and the fitness which is associated with 5g technology which are faster and has low latency and low cost for the better management of the human body. This paper aims at reporting an overview of m monitoring sensors for the better monitoring of the human body parts through a small and smart miniature devices with the 5g technological design Trends and probable evolutions are traced based on the monitoring sensors for health purpose.

In 5G wireless / mobile communication, enhanced mobile broadband (eMBB), massive machine-type communications (mMTC), ultra-reliable and low latency communications (URLLC) have been focused as the three core services, and many kinds of research are being studied all over the world. However, universities, research institutes, and industrial companies have been experiencing the repeated problem of human and material resources in simulator development for the performance analysis and verification process for wireless / mobile communication technology development. Therefore, the development time and cost have been greatly increased due to the diversity and complexity of 5G wireless / mobile communication technologies.

II. 5G MOBILE COMMUNICATION NETWORK

The fifth generation mobile communication network is 5g network. It will form a system connected by everything, like power network, biomedical etc, create a completely mobile and completely connected society, everything is related to each other, people and things are connected to things and data cloud becomes visible. Remote operation is no longer subject to space constraints. VR (virtual reality), AR (augmented reality) and other devices will become mainstream, and driverless vehicles will be truly realized. So, it will have a huge impact on health monitoring technologies, with improvements in accuracy between definite time, secure organs from infections due to comparing actual data to calculated data, etc. VR and AR will help to find solution for monitoring.

5G mobile communication networks will use millimeter wave to transmit digital information, which is the key to speed improvement of 5G mobile communication network. Due to the shorter wavelength of MMW, the size of transmitting antenna and receiving antenna can be reduced, which provides technical support for large-scale antenna system deployment. There are many potential wireless technologies in 5G network being studied.

III. KEY FEATURE

One of the best tools must have:

Large-scale antenna

Ultra-dense networking

Full spectrum access

5g-k simulator

5g k-simplatform

IV. SOME RELATED WORK

After studied lots of research papers, some related technologies are as follows:

The Vienna LTE-A of Technische Universitat Wein (TUW) simulator of TUW consists of LLS and SLS, and is implemented based on MATLAB. Their user manual contains a list of implemented functions. Users can download and use the MATLAB code directly, and must have a license for certain toolboxes in MATLAB. NYUSIM of New York University (NYU) is a 5G channel simulator and is implemented in MATLAB. It gives executable file as well as MATLAB code to make it easier for users to simulate. and LTE-Sim of Politecnico di Bari (POLIBA) is implemented in C ++.

V. WORKING OF 5G TECHNOLOGY

The 5g technology supports the uses of billions of devices and sensors positioned with 5G always helps in the improvement of any system that it is associated with the 5g technology the data can be fetched in a ultra-high speed and low latency . By 2020, the 5G-millimeter waves network is expected to support 70 billion connected devices and 250 billion connected sensors as well as enable access to 44 zettabytes (ZB) of data . The 5g technology has some of the significant features like virtually 0 latecncy,100 times more devices, speed up to 10Gbit/s, high capacity, faster response, abundant connectivity .Hence with all this supplementary features of the 5g technology in the field of the health care will facilitate the usage of the sensors devices with the better usage and connectivity , also helps to assist a proper transportations among the sensors devices with which it being faster and faster. Along with the larger number of supporting devices for the communications in 5g technology it consumes lower battery and also low cost effective for the execution with respect to other devices.

The 5g wireless network makes use of the IoT which supports in connecting the miniature sensor device with it. These miniature sensors are associated with the 5g technology helps in the enhanced data retrieval method where the monitoring of the data with the help of the 5g technology is faster, easier and cost effective. This Internet of Things (IoT) collect vast amount of the data from millions of devices . Here it is retrieving the data from one signal device monitoring sensors that is helping to connect with the 5g technology for an efficient network for data gathering, manipulation and performing.

Without 5g technology using in health care system, there are some limitations. These are as follows:

1) The one-to-one care does not support more than one single sensing model.
2) The faster throughput is not available for the data.
3) The cost is higher as it is sensing only single body part.
4) The low capacity of the data retrieval.
5) Higher latency gives more chances of problem increase as population increase day by day.

Before 5g technology, each of the devices with sensors can have monitor only the specific organ of the human body with high latency and costly process .After this advancement of 5g in monitoring one-to-one care solutions infrequently replicate more than a single sensing modality.

VI. ADVANTAGES OF 5G TECHNOLOGIES:

1. In 5g technology, all data will store in cloud, so adding a high-speed will help quickly and reliably transport huge data files of medical imagery like MRIs and PET scans. Thus all reports can be studied quickly.

2. 5G will finally bring telemedicine into the healthcare Internet of Things forefront because it will enable real-time high-quality mobile-based video. Carriers tout projections that patients will be treated sooner and have access to specialists outside of their areas, and doctors will be able to collaborate more efficiently.

3. Fast and accurate remote health monitoring is the main feature of 5g i.e. revisiting the IoT sphere, healthcare providers will be able to monitor patients and gather essential data real-time, which will improve personalized and preventive care.

4. Augmented reality (AR), virtual reality (VR) and spatial computing already provide limited applications in healthcare. 5G is expected to enhance a doctor's ability to deliver innovative, less invasive treatments.

VII. CONCLUSION

There are certain devices that are associated with touch and wearable devices that are available in the health monitoring but with respect to the 5g technology's make it faster and more accurate. But each of the devices can have monitor only the specific organ of the human body. We introduced 5G K-Simulator and 5G monitoring sensor are the sensors with smallest and high-speed antenna with extra features to be implemented with the 5g technology. The reliability and accuracy of the monitoring sensor can be done with the 5g technology. The combination of monitoring sensor and 5g technology in the world of health can give new advancement and save many lives. This sensor device is a wearable e.g small earplug ,smart band sensors that could improve monitoring of vital signs, with the aim of monitoring heart, brain ,lung and check diabetic functions for health and the fitness which is associated with 5g technology which are faster and has low latency and low cost for the better management of the human body. Through smart sensors touchable diabetic checker machine than blood test can be developed which give a big relief to diabetic patients and connected it with mobile phone and you will get instant message you when sugar level is high or low. In the field of communication, all the information must be available on mobile time to time. so the early identification of key technologies of 5G network will be of great significance to the development of 5G network. The monitoring sensor are the sensors with smallest physical devices with extra features to be implemented with the 5g technology.

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