Chapter 8
Future Generation Computing in M-Health

ABSTRACT

The implementation of healthcare-related big data in m-health has constantly been considered as the most prevalent technological breakthrough of the modern era. Indeed, the use of healthcare-related big data in m-health is a pivotal and substantially challenging task and is still not chiefly considered by the researchers. This is predominantly indispensable owing to the perpetual cascading of structured and unstructured datasets being elicited abundantly from multifold m-health applications within the purview of diverse healthcare systems. Perhaps, there are many innovative paradigms, which, if synergistically used in the domain of m-health, can generate the next level of computing in this purview. This chapter will render the relevance of big data from the point of view of m-health as well as the existing and future attributions of different machine and deep learning techniques in the pursuit of m-health.

INTRODUCTION

Perhaps, a healthy society is of the paramount importance and it requires poising among the different domains of lives of the people. Smart health monitoring systems tackles with different aspects of health such as tracking health related routines of patients and other problems of people like obesity monitoring, sports persons workload monitoring, supervising the heart rate,

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glucose level or any other concerned issues by remote physicians. Moreover, healthcare sector is also observing other issues including economic challenges in most of the developing countries. In fact, it is because of the reason that increasing number of patients and the high degree of care is needed by the patients. Mobile health (m-health) plays vital role in this pursuit. It refers the use of mobile devices and technologies to enhance and facilitate different issues pertaining to human health. It augments the collection of health related data of the patients in real time as well as its storage to the network servers connected to Internet. Further, it is probable that around 200 million people are suffering from chronic diseases such as cancer, asthma, cardiovascular diseases, arthritis, dementia, Alzheimer etc worldwide. These diseases requires periodic diagnosis, monitoring and expert opinions (Syed et al., 2018) (Telemedicine, 2017). It is also predicted that the predominance of many diseases will go high in different sub-continents of the world by 2050 (Standing, 2016). It has also been observed that China and India possesses the highest number of diabetic patients in the world. Almost 110 million and 69 million of diabetic patients are in China and India respectively. Further, it is also expected that this number may rise from the current 415 million to 642 million by 2040 (World, 2016). Indeed, a segment of approximately 8.9% to 16.4% of total Gross Domestic Product (GDP) is earmarked on healthcare sector by most of the countries as observed in a recent survey (World, 2016). Moreover, in 2012, approximately 500 PB of data was accumulated from healthcare sectors. It is also forecasted that over 2500 PB of medical data will be collected by medical sectors by 2020. In addition, in United States also the big data pertaining to medical sector is also exceeding the50 million patients' records that heavily depend on the concept of data-driven so that frequent healthcare-related challenges can be tackled effectively. Therefore, it is explicit that IoT based technologies which rely on the amount of data streams that emerges from the smart devices communication will play crucial role in providing the improved healthcare services.

Further, it has also been reflected through extensive literature survey that in present scenario heterogeneous systems will be needed for storing the clinical, biological, and physical data. It is also pertinent to mention that plethora of this data is in structured; semi structured or in unstructured templates and hybridization of all these data collected from heterogeneous sources requires in-depth analysis for pragmatic and efficient treatment of a particular patient (Saphana, 2017). Therefore, there is substantial need of the big data analytic tools and techniques in m-health for efficient processing of this huge amount of data which will require high speed processors so that quick