Chapter 19
A Survey on Prediction Using Big Data Analytics

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ABSTRACT

This article describes how nowadays, the growth of big data in bio-medical and healthcare community services is increasing rapidly. The early detection of diseases and patient care are analyzed with the help of accurate analysis of medical data includes diagnosed patients' details. The analysis of accuracy rate is considerably reduced when the quality of medical data is unclear since every part of the body has unique characteristics of certain regional diseases that may suppress the prediction of diseases. This article reviews the detailed survey of different prediction methods developed for analyzing the accuracy rate of disease affected patients in 2015-2016 mainly focuses on choosing the efficient predictions based on the quality of medical data not only provides the overall view of prediction methods but also gives the idea of big data analytics in medical data further discusses the methods, techniques used and the pros and cons of prediction methods.

1. INTRODUCTION

Nowadays 50% of Americans have one or more chronic diseases, and 80% of American medical care fee is spent on chronic disease treatment. With the improvement of living standards, the incidence of chronic disease is increasing. The United States has spent an average of 2.7 trillion USD annually on chronic disease treatment. This amount comprises 18% of the entire annual GDP of the United States. The healthcare problem of chronic diseases is also very important in many other countries

In China, chronic diseases are the main cause of death, according to a Chinese report on nutrition and chronic diseases in 2015, 86.6% of deaths are caused by chronic diseases. Therefore, it is essential to perform risk assessments for chronic diseases. Electronic health records (EHRs) are digital versions of a patient's medical history, maintained over time by health care providers that contain information

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relevant to a patient's care, including to demographics, diagnoses, medical procedures, medications, vital signs, immunizations, laboratory results, and radiology images. With the growth in medical data collecting electronic health records is more convenient. One of the applications is to identify high-risk patients which can be utilized to reduce medical cost since high-risk patients often require expensive healthcare (Chen Hao, Hwang, & Wang, 2016).

Convolutional Neural Network-based Multimodal Disease Risk Prediction (CNN-MDRP) algorithm is applicable for structured and unstructured data. The disease risk model is obtained by the combination of structured and unstructured features and the accuracy is analysed.

2. RELATED WORKS

2.1. Big Data Analytics

The massive set of data is generated from different organizations throughout the world this huge and heterogeneous data is called Big Data. Big data plays an important role in achieving predictive analysis in the healthcare domain. The transformation of using sophisticated technologies by healthcare provides to gain insights from clinical datasets and make informed decisions had changed by big data analytics with the help of Hadoop framework. Effective healthcare management can be achieved by providing effective data driven services to people by predicting their needs (Wang & Hajli, 2016). Big data analytics in healthcare is defined as the ability to acquire, store, process and analyze large volume of health data in various forms, and deliver meaningful information to users, which allow them to discover business values and insights in a timely manner. The theoretical foundation of Big data analytics-enabled business value (BDA-BV) model comprises of two elements resource based theory (RBT) and capability building view. RBT has been the principal theoretical foundation for explaining how resources can be transformed into a sustained competitive capability building view has been utilized to complement the pitfalls of RBT.

The real-world implementation of big data analytics in healthcare big data analytics capabilities are derived from the various tools and functionalities are mainly triggered by a data processing component. Data aggregation: The tools use to transform different types of healthcare data into a data format that can be read by the data analysis platform. Data processing: The tool use to process all kinds of data and perform appropriate analysis to harvest insight and decision. Data visualization: The tool used to produce reports about daily healthcare services to aid managers decisions and actions.

2.1.1. Big Data and Smart Healthcare Systems

Big data and smart healthcare systems (Pramanik, Lau, & Demirkan, 2005) are independently attracting extensive attention from both academic and industry the combination of both big data and smart systems can expedite the prospects of the healthcare industry. A big data enabled smart healthcare system framework (BSHSF) that offers theoretical representations of an intra and inter organized business model in the healthcare context. The technology and infrastructure of smart cities the reconstruct thinking behind existing healthcare systems (eg: mhealth, ehealth) and telemedicine to create a new and comfortable ubiquitous concept which is called as smart health. Also, smart health integrates idea from ubiquitous computing and ambient intelligence