



Prediction and Diagnosis of Down Syndrome Disease by using the CHAID Algorithm

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ABSTRACT

Today, development of technology and the use of modern medical equipment and update technology produce massive amounts of stored information in the medical database. Analysis and discovery of knowledge from medical database is difficult due to the high volume of data and is requires a newer technology that data mining technologies to achieve this important to help its powerful algorithms. Data mining techniques with extract knowledge and the unseen patterns from huge volumes of data and build models related to medical databases, designed decision support system that help decision-making to Medical. The main objective of this paper has been to examine how to apply data mining techniques to predict and diagnosis of Down syndrome disease based on the medical information of 200 patients referred to medical laboratories in the country by using data mining algorithm CHAID in Rapid Miner software. The results showed that the CHAID algorithm with 100% accuracy has ability diagnosis of Down syndrome disease.

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Introduction

Modern medicine produce large amount of stored information in the medical databases. Need to science is essential to search in this data and knowledge discovery from databases. In fact, knowledge discovery from databases is the process of identify patterns and exist models in the data. Patterns and models that is valid, innovative, potentially useful and fully understood. Data mining is the stage of knowledge discovery process with the help of special algorithms of data mining and acceptable performance computing finds patterns or models in data. One of the fields that are requires use of these tools for analysis extensive data and predictive modeling with new computational methods are medical science. The purpose of data mining predictive techniques in clinical medicine is building a predictive model that helps doctors to improve methods of prevention, diagnosis and treatment programs [1]. Some of the chronic diseases such as diabetes, obesity and cardiovascular disease was the leading cause of death and disability in most countries [2] and can be predicted or detected with explored on previous similar patient data, compare and implementation common symptoms of the disease. Data mining tools can be help in the areas of predicting and diagnosing diseases, the effectiveness of treatment, identify side effects of medications and other medical science. Han and colleagues in 2008, by using data mining algorithms is identified diabetes in the patient's database [3]. Big Hwan Cho et al, in 2008 by using data mining is predicted existence neuropathy in patients with

diabetes [4]. Kurosaki and colleagues in 2012, examined to predict cancer in patients with hepatitis c [5]. In the study of Silvera and colleagues in 2014, were investigated risk factors of lifestyle and dietary in patients with gastric cancer [6]. Tavakoli and colleagues in 2010 achieved results that show the use of data mining is much better than the hospital algorithm performance and the doctor's mental model [7]. Syndrome called to set of physical and mental symptoms of a specific condition and Down is the name of English physician that about 200 years before was discovered this set of symptoms. The cause of this phenomenon is a kind of disorder in the arrangement of chromosomes that occurs in embryonic stages and during cell division. Patients with Down syndrome in their body cells have 47 chromosomes instead of 46 chromosomes. Chromosomes are a very small portion of the cell, which genes collected in it and contain information that shapes our body. For example, skin color, eyes, hair, female or male is determined in this small section. The extra chromosome in the body of a person who have Down syndrome takes the impact in the process of the above formation and be causing changes of physical and mental. People with Down syndrome have differences with others. Some of these differences are related to the physical characteristics of individuals and the other part is related to intellectual characteristics, the syndrome occurs before birth. Nowadays, using of screening methods to distinct high risk from low-risk cases. The purpose of this paper is to examine the role and scope of predictive data mining in medical science and propose an appropriate framework to the