Chapter 12
Other Diseases Detection:
Hepatitis

ABSTRACT

Considering the importance of the problem of medical diagnosis, this chapter investigates the application of an intelligent system based on artificial neural network for decision making for Hepatitis. First, datasets are provided for detecting Hepatitis, based on the requirements of artificial neural network inputs and outputs consisting of associated symptoms of each disease as fields of patients' records. Then multilayer perceptron (MLP) artificial neural network is trained to classify Hepatitis disease. In the next sections, details are described.

1 INTRODUCTION

Classification is one of the most important applications of ANN. In order to solve the problem of classification it is needed to range the available static patterns (for instance ranging the parameters of medical examination data or information about a client) in desirable group or class. Various methods for data representation are suggested. Using the vector representation is one of the most common of them. Each vector is composed of parameters of a pattern which is effective is assigning a pattern to a class. For example in medical diagnosis the check up data is used to prepare the vector of components that ANN use it to assign the pattern to a class. Before using the data in ANN it is required that data be normalized. The simple

normalization method is by dividing all data by the highest data value in the group. Following is the details of the intelligent system based on neural network for detecting hepatitis (Wan & Siraj, 2006).

2 HEPATITIS

Hepatitis symptoms in the early stages are similar to flu symptoms such as general fatigue, joint and muscle pain, and loss of appetite. Other following symptoms are nausea, vomiting, and diarrhoea or constipation with a low-grade fever (up to 39°C). The liver may enlarge and become tender, when the disease progresses. Also chills, weight loss, and distaste for food and, curiously, cigarettes may occur. Changing the colour of the urine and faeces are the next symptoms. The clinical features of hepatitis are found in all types of viral hepatitis, ranging from asymptomatic or subclinical to classical jaundice, and through to acute liver failure and death. Sometimes a combination of fatigue, fever, loss of appetite, nausea, vomiting, diarrhoea, or abdominal discomfort may occur. Sometimes patients notice itching of the skin and will notice the dark urine and light-coloured stools, followed by jaundice, in which the skin and whites of the eyes appear yellow. With the onset of jaundice, other symptoms tend to subside. Jaundice is due to accumulation of bilirubin in the blood. It is formed primarily from the breakdown of "haem" in red blood cells and is a waste product. In a healthy individual, there is only a small amount of bilirubin circulating in the blood. However, increased levels of serum bilirubin are found in patients that are suffering from conditions that increase the destruction of red blood cells, and conditions such as liver disease, where there is a decreased removal of the substance from the blood stream. Bilirubin is a yellow pigment and when accumulated in the blood in abnormally high levels, will make the skin and the whites of the eyes appear yellow. Jaundice (or icterus) is the clinical term for this condition. In some cases the cause of acute hepatitis can be suggested by clinical features and the patient's history. However, specific laboratory tests must be used to establish a diagnosis (Walker, & Kwon, 1997).

Biochemical tests "Liver function tests" (LFTs) is a commonly used term to describe a group of blood tests that assess the general state of the liver and biliary system. Routine blood tests can be divided into those tests that are true LFTs, such as for serum albumin, prothrombin time, or serum bilirubin, and those tests that are simply markers of liver or biliary tract disease, such as for the various liver enzymes. Serum bilirubin is generally considered a true test of liver function, since it reflects the liver's ability to take up, process, and secrete bilirubin into the bile. It is relatively non-specific, however, because many forms of liver or biliary tract disease can result in elevated levels of serum bilirubin. In addition to the usual liver

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