Universiti Teknologi MARA

Sign Language Recognition Using Back Propagation Neural Network

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ABSTRACT

Nowadays, many people do not understand what are mute people want to say. Generally, people with hearing impaired and speech disability use sign language based on hand gestured with specific motion to present 'language' they are communicating. This project is about recognizing hand gesture for sign language using back propagation (BP) algorithm that is one of the training algorithms used in the Artificial Neural Network (ANN). The purpose of this project is to implement static image processing approach to recognize sign language and to develop a prototype system that can convert the sign language into text. The image processing tools are used to process the image with regards to enhance the image and to extract useful information. The useful information will be fed to the ANN whereby the BP training algorithm will be performed in order to extract the knowledge of the image that is the final weight. To ensure the performance of the system, a number of experiments are done by adjusting the parameters of the BP training algorithm. The result of the experiment shows the percentage of successful recognition. As a result, the three layer networks with 3500 input neurons, 500 hidden neurons and 4 output neurons are decided. In the end of research project, found out that the result from neural network model is excellent where the accuracy rate for the network is 100%. In conclusion, neural network is the most proven that can give more accurate result to detect hand gesture that recognize the sign language.

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CHAPTER 1

INTRODUCTION

This chapter will discuss about the background of this project. It is provided specific about project background, problem statement, objectives, scopes, significant and expected outcome of this project.

1.1 Background of study

Sign language (SL) can be described as a communication using hand gesture and signs without a voice, as a used by mute people. SL is one of the ways for mute people to communicate with normal people (Maraqa *et al*., 2012). Usually, normal hard to understand the signals based communications used by mute people. Hence, the study of gesture based communication is required to enhance the correspondence obstruction between the mute people and normal people community (Liang, 2011).

SL can give words to signs. It likewise gives indications of alphabets to achieve words that do not have relating sign in the communication through signing(Vargas *et al.,* 2011). Subsequently, despite the fact that decision can be made using sign an alphabet, achieving with indications of words rapidly. The gesture based communication using numerical sign language for this project. Example of numerical sign language motions demonstrated in Figure 1.1.

Finger spelling has been brought to communicate through signing with a specific goal to work as a problem between the sign language and normal communication. It is illustration of the letters of composing framework and numerical frameworks just using the hands (Maraqa *et al*., 2012). Finger spelling is frequently the important thing realized when adapting in sign language. This propels will be taken of this work to focus on finger spelling recognition.

Based on research from the World Health Organization (WHO), there are around 360 million people living with disabled hearing in the world. They also said that