UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

HAND MOVEMENT RECOGNITION FOR DISABLED PERSON

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ABSTRACT

Disabled person always having difficulty in communicate with other people. For example, deaf persons cannot hear well and struggle to speak correctly. They communicate with other people using sign language which is one way to communicate using combining hand shapes, orientation and movement of the hands. Therefore, the purpose of this project is to develop a hand movement recognition system using android based platform. The hand movement is detected using a glove sensor which is constructed using a set of bend sensors that will measure the value of hand movement of each five fingers. The main part of this project is the controller which is using Arduino microcontroller that will process data of the hand movement. Besides, an android application is developed to display related output and produce audio of the translated hand movement data. A set of data collection is analyzed to evaluate the accuracy of the hand movement recognition method. Overall, this project offers an alternation to learn the basic of sign language among disabled person in a low cost and efficient manner.

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INTRODUCTION

1.1 BACKGROUND OF STUDY

Gesture recognition is the mathematical interpretation of a human movement by a computing device. Gesture is defined as an easy-to-read, meaningful body movement that expresses an idea, opinion, emotion, etc. Recognition is the action or process of identifying or being recognized. There are many type of technique to identify movement for example facial expression to recognize emotion and hand gesture to communicate.

Hand movement recognition or sign language recognition systems are used to translate sign language into text or speech to enable communication with people who did not familiar with sign language. Usually, the focus of these systems is to identify hand shape including position, adjustment, and motion of hands. In addition, there are three types of sign language identification; finger spelling for alphabets, isolated words, and continuous gesturing for making a complete sentences. Finger spelling for alphabet is a basic sign language to show one by one alphabet to be spell. It is single handed and most of the alphabet is in static position except for letter J and Z [1]. Other than that, isolated word is a combination of spelling from several letters to be one hand shape and movement of sign language. Susanna has proposed in [2], where from speech recognition and word-level ASL, she describe a system in using the traditional techniques. In addition, the last type of sign language is continuous gesturing for making a complete sentence. This kind of sign language is often use by deaf-mute person. It is a combination of isolated word with hand and body movement. The difficulty of hand movement recognition system is how to form the resulted hand gestures to be understood and well interpreted by the computer.

Furthermore, these hand shapes arrangement are captured to determine their corresponding significations, using two methods: sensor-based and vision-based.