UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF SIGN LANGUAGE TRANSLATOR DEVICE

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Automation and Robotic) with Honours.

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ABSTRAK

Pekak-bisu adalah istilah orang yang tidak dapat bercakap dengan normal kerana cacat sejak lahir atau mengalami kemalangan yang menjadikan mereka cacat kekal. Orang bisu-pekak dapat menghasilkan bunyi tetapi tidak dapat mengartikulasikan dengan cukup baik untuk bercakap atau tidak dapat merumuskan kata dan ayat yang koheren. Mereka biasanya menggunakan bahasa isyarat dengan bantuan isyarat tangan untuk berkomunikasi atau menghantar maklumat kepada orang lain. Masalah timbul apabila kebanyakan orang tidak begitu mahir dengan bahasa isyarat sehingga mewujudkan jurang komunikasi antara orang normal dan orang pekak. Mengenai masalah ini,projek ini berdasarkan teknik bukan penglihatan. Teknik bukan penglihatan menggunakan sensor. Ia dapat mengurangkan salah komunikasi dengan menterjemahkan isyarat bahasa dari pergerakan tangan menjadi teks atau bunyi yang dapat dibaca yang dapat difahami oleh semua orang dengan mudah. Penggunaan mikrokontroler Arduino adalah untuk memproses input dari sensor dan mengubahnya menjadi data yang dapat dibaca. Projek ini juga dilengkapi dengan penggunaan aplikasi android untuk memantau atau menampilkan data output yang diproses oleh mikrokontroler Arduino. Projek ini mudah alih dan mesra pengguna. Ini juga secara tidak langsung menjadikan orang normal memahami bahasa isyarat juga. Dari itu, salah komunikasi antara orang-orang bisu pekak dengan masyarakat dapat dihapuskan. Kesimpulannya, penggunaan projek ini sangat praktikal untuk komunikasi yang lebih baik di masa hadapan.

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ABSTRACT

Deaf-mute is a term of people who are unable to speak normally because of defective from birth or having accident that make them permanent disability. Deaf-mute people can produce sounds but cannot articulate well enough to speak or cannot formulate coherent words and sentences. They usually used sign language with the help of hand gestures to communicate or sending information to others. The problem arises when most people are not quite familiar with sign language, thus creating the communication abyss between normal people and deaf-mute people. Regarding to this problem, this project was based on non-vision technique. Non-vision technique used sensors. it that can reduce miscommunication by translating sign language from hand gestures into readable text or sounds that can easily be understood by everyone. The used of Arduino microcontroller is to process the inputs from sensors and convert them into readable data. This project also comes with the use of android application which is to monitor or display the output data that processed by Arduino microcontroller. This project was portable and user friendly. It also indirectly makes normal people understand sign language as well. From that, the miscommunication between deaf-mute people with the society can be eliminated. In conclusion, the used of this project was practically good for better communication in future.

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DEDICATION

To my beloved family

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LIST OF ABBREVIATION

ASL	-	American Sign Language
SEE	-	Signal Exact English
HMI	-	Human Machin Interface
ARM	-	Advance RISC Machine
DOF	-	Degree of Freedom
USB	-	Universal Serial Bus
OS	-	Operating System
APP	-	Application
LCD	-	Liquid Crystal Display
ADC	-	Analog Digital Converter
WHO	-	World Health Organization

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, it will explain about background of the project, problem statement, objective, project scope and the thesis outline.

1.2 Project Background

Nowadays, sign languages have been used widespread among deaf and mute community to communicate in their daily life. Sign languages was a language that use different sign made with the hands and other movements, including facial expressions and postures of the body which is usually used by people who are deaf or mute. However, the knowledge of these sign language is still not familiarized and unclear among the public, these will affect the deaf and mute community to put themselves among society and become more stand out.

Lately, government is doing some efforts to reduce the abyss between these community by doing event that make the sign language well known among the normal people.

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The university also offers the sign languages as one of the subjects to be learned in campus. Other than that, sign languages are not standardized throughout the globe. This is because each country has its own perspective and native sign language, which make them more specifics and hard to categorized. For example, American sign language (ASL) is different language from British sign language (BSL) and Americans who know ASL may not understand BSL. It will make these sign language users cannot understand each other due to many sign languages exist worldwide.

According to the World Health Organization (WHO), millions of people across the world live with the disabling of hearing loss. The majority comes from the people who live in low and middle incomes countries where they do not have appropriate tools and good hearing care services. Without suitable inventions, hearing loss will be a very challenging in lives of those affected. However, there are many causes of hearing loss that can be prevented through public health measures, higher education and empowerment. Raising awareness and improving access service can reduce the impact of hearing loss. Moreover, over 5% of the world population which is 466 million people has disabling hearing loss where 432 million adults and the rest are children. WHO estimated that by 2050, the people with hearing loss will be over 900 million people or one in every ten people will have disabling of hearing.

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1.3 Problem Statements

Sign language is not an official language among public, but it is important to get to know this sign language because day by day individuals will meet new friends in their lives. If the person was deaf or mute, it will be easy to understand them. The problem arises when most individuals are lack of awareness and miscommunications during their conversation because do not familiar with sign language. Therefore, the Sign Language Translator is developed to overcome those problems.

1.4 Objectives

There are several objectives to be achieved from this project:

i) To develop an Android application to be connect with Arduino Nano microcontroller as a system.

ii) To develop a glove that can translate alphabet sign language from hand wrist into text.

iii) To analyze the performance of the sign language translator.

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