

VOICE ACTIVATED DOOR CONTROL SYSTEM

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ABSTRAK

Projek ini bertujuan membina sebuah pengaktifan sistem melalui suara untuk membuka pintu. Sistem ini direka bertujuan untuk memudahkan pengguna cacat membuka atau menutup pintu apabila menaiki kerusi roda. Oleh itu teknologi pengaktifan suara dipilih disebabkan sistem itu boleh diaktifkan hanya dengan menggunakan suara. Dengan adanya sistem ini, mereka dapat menjimat dari segi masa dan memudahkan kerja harian. Perintah yang digunakan akan disimpan dalam trainign kit. Alat itu akan mengesan suara pengguna dan buat pepadanan dengan perintah yang telah disimpan terdahulu pada data dasar. Sekiranya perintah itu sama dengan perintah yang disimpan, maka ia akan menghantar isyarat yang padan untuk mengaktifkan litar H-jambatan. Motor akan berjalan dalam arah ikut jam atau berlawanan jam dengan membaca nombor binari yang diterima. Maka dengan ini dapat memudahkan kerja harian pengguna cacat.

ABSTRACT

In now's a day, voice activated technology is effective apply to normal live task. By using this technology, handicap person can run their normal live task as normal person easier. Therefore a project of voice activated door control system is design. The system is design base on the objective of simplify the task of opening or close door for handicapped person. Therefore a solution should be invented to solve the problem since for a handicap person it is sometimes a difficult task to open or close door using a wheel chair. A voice activated door control system suitable use to solve this problem. This is because the system can be activated using specified commands. Through the command it can control the direction of motor to open or close the gate door. As a conclusion, this system can solve the difficult task of handicapped people easily.

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SHORT FORM LIST

LSI	large scale integration
LED	Light emitting diode
TRN	Train
CLR	Clear
DC	Direct current
IC	Integrated circuit
PCB	Printed circuit board
PDA	Personal Digital Assistant
SPDT	Single-pole double-throw
NC	Normally close
NO	Normally open

ATTACHMENT LIST

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1	2N2222	51
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CHAPTER 1

INTRODUCTION

1.1 Introduction

In now's a day, voice activated technology is effective apply to normal live task. By using this technology, handicap person can run their normal live task as normal person easier. Therefore a project of voice activated door control system is design. The system is design base on the objective of simplify the task of opening or close door for handicapped person. Therefore a solution should be invented to solve the problem since for a handicap person it is sometimes a difficult task to open or close door using a wheel chair. A voice activated door control system suitable use to solve this problem. This is because the system can be activated using specified commands. Through the command it can control the direction of motor to open or close the gate door. As a conclusion, this system can solve the difficult task of handicapped people easily.

1.2 Objective

There are several objective been establish to this project to make sure that it will successful completed. The project main objective is to simplify the task of opening or closing door for handicapped people since it is a difficult task for them to open or close the door.

Beside that, the voice recognition system that use in this project can only responds to the specified command. For example, open or close. Unique voice features also been use in this project since it is a secure system.

1.3 Problem statement

For a handicap person, it is sometimes a difficult task to open or close door using a wheel chair. Therefore a solution should be invented to solve the problem. For example this project will solve their problem effectively since the action of open or close the gate door can be control through training kit by using voice activated technology.

In now's a day when surrounded by a number of digital devices, control of these devices becomes complicated. Therefore selecting a proper remote commander for each device would be frustrating.

The voice recognition system that use in this project is not yet able to filter out command under the presence of noise or cross talk. Therefore there is some weakness of this system design.

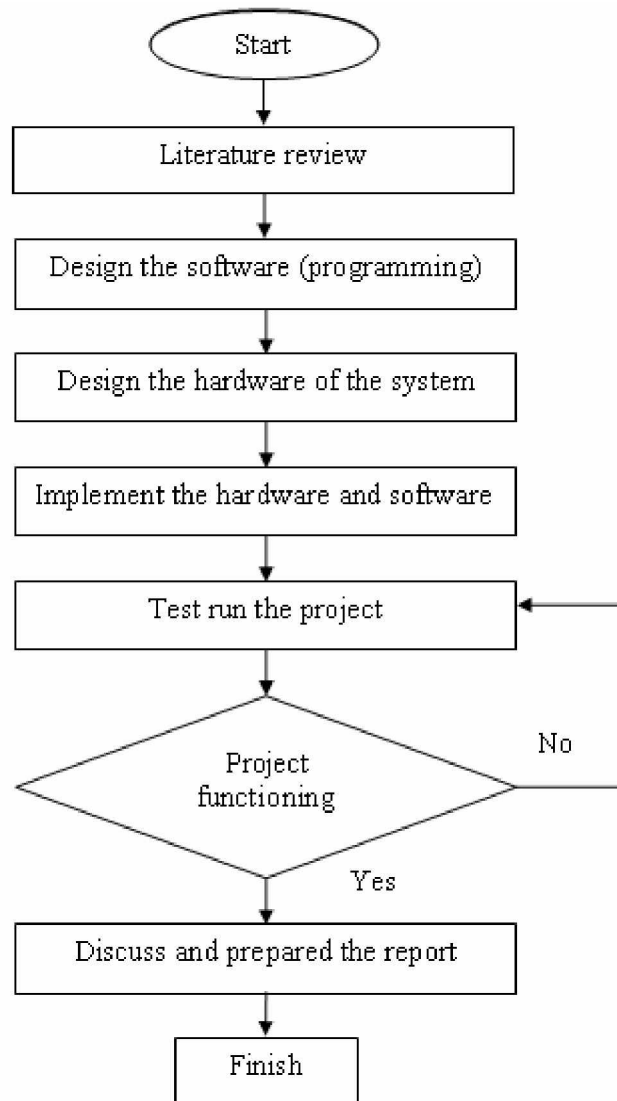
This system is designed to open or close garage door. Since this kind of door quite heavy, therefore the motor that use must has ability to drive the garage door. Therefore the motor that chose to carry the garage door also quite expensive in term of prize. This also burdens the budget of this project, thus it is choose to build a model of gate door to perform the action that done rather than using real gate door.

1.4 Scope of project

This project will cover the area which state as follows:

1. The system that design has different ability to open or close the garage door which depends on the different power of motor.
2. The voice recognition system can recognized command such as “open” and “close” only.

1.5 Methodology



1.6 Report structure

In now's a day, voice activated technology is effective apply to normal live task. By using this technology, handicap person can run their normal live task as normal person easier. Therefore a project of voice activated door control system is design.

The objective of this project is to simplify the task of opening or closing door for handicapped people. The voice recognition system that use in this project can only responds to the specified command and unique voice features since it is a secure system.

The problem statements are as follow. For a handicap person, it is sometimes a difficult task to open or close door using a wheel chair. Therefore a solution should be invented to solve the problem. When surrounded by a number of digital devices, control of these devices becomes complicated. Selecting a proper remote commander for each device would be frustrating. The voice recognition system is not yet able to filter out command under the presence of noise or cross talk. This system is designed to open or close garage door. Since this kind of door quite heavy, therefore the motor that use must has ability to drive the garage door.

There is some limitation in this project such as the system that design has different ability to open or close the garage door which depends on the different power of motor. The voice recognition system can recognized command such as "open" and "close" only. Beside that, the voice recognition system is not yet able to filter out command under presence of noise or cross talk.

The project design will start by firstly; the software part of this project will be design follow by the hardware part of this project. Then both part will be implement and test until functioning correctly. Then the project is complete done.

The chapter 1 of this project is the introduction of the project which includes the objective, problem statement, scope of project, methodology and report structure.

Chapter 2 will include the literature review of all related theory use in this project includes the software and hardware part. The main theories included Training Kit SR07 and gate door action networking H-bridge circuit. Chapter 3 was the explanation of the methodology of this project in detail. Chapter 4 was the result that obtain and lastly, chapter 5 which include the discussion and summary of this project.

CHAPTER 2

LITERATURE REVIEW

This chapter will include the theory and component that will use in this subject. The main theories that related include human voice, speech recognition, Articulatory Phonetics and Speech generation. Beside that, components include Training Kit SR-07 and gate door action networking.

2.1 Human voice

The human voice consists of [sound made](#) by a [human being](#) using the [vocal folds](#) for [talking](#), [singing](#), [laughing](#), [crying](#), [screaming](#) and others. Human voice is specifically that part of human sound production in which the vocal folds are the primary sound source. Generally speaking, the mechanism for generating the human voice can be subdivided into three parts, the lungs, the vocal folds within the larynx, and the articulators.

The [lung](#) as the pump must produce adequate airflow and air pressure to vibrate vocal folds. This air pressure is the fuel of the voice. The vocal folds or vocal cords are a vibrating valve that chops up the airflow from the lungs into audible pulses that form

the laryngeal sound source. The muscles of the larynx adjust the length and tension of the vocal folds to 'fine tune' [pitch](#) and [tone](#). The articulators which is the parts of the [vocal tract](#) above the larynx consisting of [tongue](#), [palate](#), [cheek](#), [lips articulate](#) and [filter](#) the sound emanating from the larynx and to some degree can interact with the laryngeal airflow to strengthen it or weaken it as a sound source.

The vocal folds, in combination with the articulators, are capable of producing highly intricate arrays of sound. The tone of voice may be modulated to suggest [emotions](#) such as [anger](#), [surprise](#), or [happiness](#). [Singers](#) use the [human voice as an instrument](#) for creating [music](#)

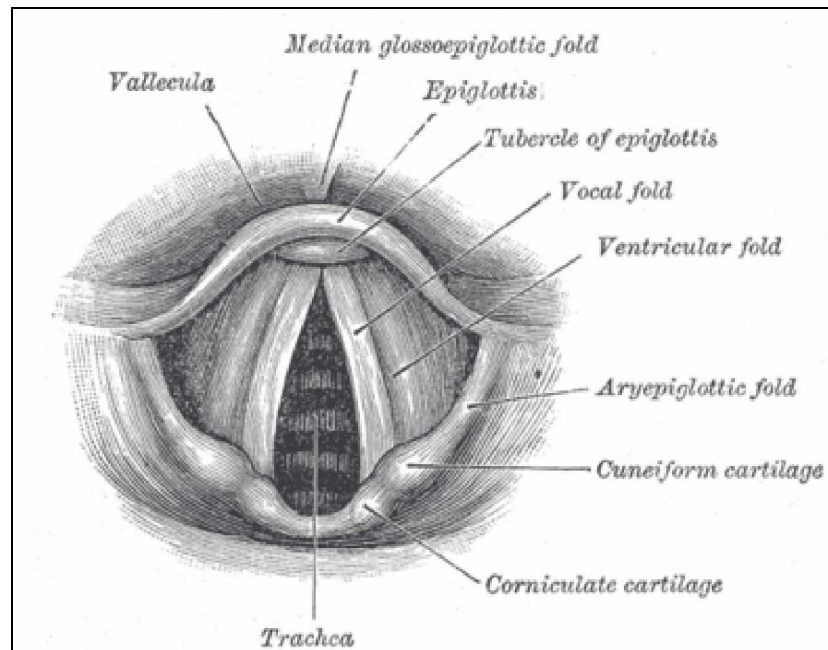


Figure 2.1 A labeled anatomical diagram of the [vocal folds](#) or cords

As seen in the Figure 2.1, the folds are located just above the [trachea](#) which the windpipe which travels from the lungs. Food and drink do not pass through the cords but instead pass through the [esophagus](#), an unlinked tube. Both tubes are separated by the [epiglottis](#), a "flap" that covers the opening of the trachea while swallowing.

The folds in both sexes are within the [larynx](#). They are attached at the back which is side nearest the spinal cord to the [arytenoid cartilages](#), and at the front which is side under the chin to the [thyroid](#) cartilage. They have no outer edge as they blend into the side of the breathing tube while their inner edges or "margins" are free to vibrate in the hole. They have a three layer construction of an [epithelium](#), vocal ligament, then muscle which is the [vocalist muscle](#) can shorten and bulge the folds. They are flat triangular bands and are pearly white in color. Above both sides of the vocal cord is the [vestibular fold](#) or false vocal cord, which has a small [sac](#) between its two folds

The sound of each individual's voice is entirely unique not only because of the actual shape and size of an individual's vocal cords. This also due to the size and shape of the rest of that person's body, especially the vocal tract, and the manner in which the speech sounds are habitually formed and articulated. Humans have vocal folds which can loosen, tighten, or change their thickness, and over which breath can be transferred at varying pressures. The shape of chest and neck, the position of the tongue, and the tightness of otherwise unrelated muscles can be altered. Any one of these actions results in a change in pitch, volume, timbre, or tone of the sound produced. Sound also resonates within different parts of the body, and an individual's size and bone structure can affect somewhat the sound produced by an individual.

2.1.1 Vocal registration

Vocal registration refers to the system of vocal registers within the human voice. A register in the human voice is a particular series of tones, produced in the same vibratory pattern of the [vocal folds](#), and possessing the same quality. Registers originate in [laryngeal](#) function. They occur because the vocal folds are capable of producing several different vibratory patterns. Each of these vibratory patterns appears within a particular [range](#) of [pitches](#) and produces certain characteristic sounds. The term register can be somewhat confusing as it encompasses several aspects of the human voice.

The term register can be used to refer to any of the following:

1. A particular part of the [vocal range](#) such as the upper, middle, or lower registers.
2. A [resonance](#) area such as [chest voice](#) or [head voice](#).
3. A [phonatory](#) process.
4. A certain vocal [timbre](#).
5. A region of the voice which is defined or delimited by vocal breaks.
6. A subset of a [language](#) used for a particular purpose or in a particular social setting.

In [linguistics](#), a register language is a language which combines [tone](#) and vowel [phonation](#) into a single [phonological](#) system. Within [speech pathology](#) the term vocal register has three constituent elements: a certain vibratory pattern of the vocal folds, a certain series of pitches, and a certain type of sound. Speech pathologists identify four vocal registers based on the physiology of laryngeal function: the [vocal fry register](#), the [modal register](#), the [falsetto register](#), and the [whistle register](#). This view is also adopted by much vocal pedagogy.

2.1.2 Vocal resonance

Vocal resonance is the process by which the basic product of phonation is enhanced in timbre and/or intensity by the air-filled cavities through which it passes on its way to the outside air. Various terms related to the resonance process include amplification, enrichment, enlargement, improvement, intensification, and prolongation; although in strictly scientific usage acoustic authorities would question most of them. The main point to be drawn from these terms by a singer or speaker is that the end result of resonance is, or should be, to make a better sound. There are seven areas that may be listed as possible vocal resonators. In sequence from the lowest within the body to the highest, these areas are the chest, the tracheal tree, the larynx itself, the pharynx, the oral cavity, the nasal cavity, and the sinuses. Speech Recognition