

Engine Start Features Using Voice Command



Engineering

KEYWORDS: Components, working mechanism, programing, digital audio convertor

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ABSTRACT

Speech recognition applications are becoming more and more useful nowadays. Various interactive speech aware applications are available in the market. But they are usually meant for and executed on the traditional general-purpose computers. With growth in the needs for embedded computing and the demand for emerging embedded platforms, it is required that the speech recognition systems (SRS) are available on them too. PDAs and other handheld devices are becoming more and more powerful and affordable as well. It has become possible to run multimedia on these devices. Speech recognition systems emerge as efficient alternatives for such devices where typing becomes difficult attributed to their small screen limitations.

1. INTRODUCTION

The speech recognition system is a completely assembled and easy to use programmable speech recognition circuit. Programmable, in the sense that you train the words (or vocal utterances) you want the circuit to recognize. This board allows you to experiment with many facets of speech recognition technology. It has 8 bit data out which can be interfaced with any microcontroller for further development. Some of interfacing applications which can be made are controlling home appliances, robotics movements, Speech Assisted technologies, Speech to text translation, and many more.

2. COMPONENTS OF VOICE RECOGNITION SYSTEM IN BIKE

2.1 Microcontroller



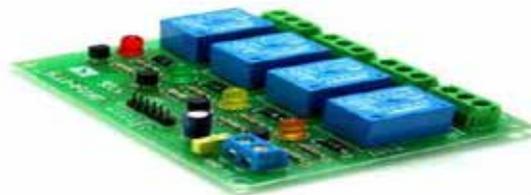
PIC is a family of modified Harvard architecture microcontrollers made by Microchip Technology, derived from the PIC1650 originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to "Peripheral Interface Controller" now it is "PIC" only.

PICs are popular with both industrial developers and hobbyists alike due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, and serial programming (and re-programming with flash memory) capability

The original PIC was built to be used with General Instrument's new CP1600 16-bit CPU. While generally a good CPU, the CP1600

had poor I/Performance, and the 8-bit PIC was developed

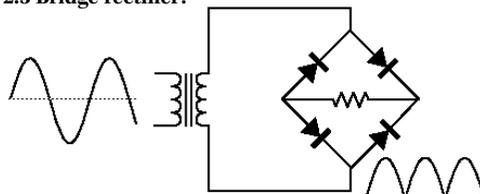
2.2 Relay board:



A **relay** is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

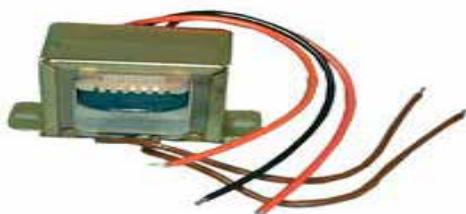
A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays"

2.3 Bridge rectifier:



A **rectifier** is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as **rectification**. Physically, rectifiers take a number of forms, including vacuum tube Diodes, mercury-arc valves, copper and selenium oxide rectifiers, semiconductor diodes, silicon-controlled rectifiers and other silicon-based semiconductor switches. Historically, even synchronous electromechanical switches and motors have been used. Early radio receivers, called crystal radios, used a “cat’s whisker” of fine wire⁸ pressing on a crystal of galena (lead sulfide) to serve as a point-contact rectifier or “crystal detector”.

2.4 Transformer:



A **transformer** is an electrical device that transfers energy between two circuits through electromagnetic induction. A transformer may be used as a safe and efficient voltage converter to change the AC voltage at its input to a higher or lower voltage at its output. Other uses include current conversion, isolation with or without changing voltage and impedance conversion.

A transformer most commonly consists of two windings of wire that are wound around a common core to provide tight electromagnetic coupling between the windings. The core material is often a laminated iron core. The coil that receives the electrical input energy is referred to as the primary winding; the output coil is the secondary winding.

2.5 Crystal oscillator:



A **crystal oscillator** is an electronic oscillator circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency.

This frequency is commonly used to keep track of time (as in quartz wristwatches), to provide a stable clock signal for digital integrated circuits, and to stabilize frequencies for radio transmitters and receivers. The most common type of piezoelectric resonator used is the quartz crystal, so oscillator circuits incorporating them became known as crystal oscillators, but other piezoelectric materials including polycrystalline ceramics are used in similar circuits.

3. PROGRAMMING METHOD:

Speech recognition basically means talking to a computer, having it recognize what we are saying, and lastly, doing this in real time. This process fundamentally functions as a pipeline that converts PCM (Pulse Code Modulation) digital audio from a sound card into recognized speech. The elements of the pipeline are:

Inventory of speech recognition unit speech	Word dictionary (In terms of chosen unit)	Grammar	Task model
FEATURE ANALYSIS	UNIT MACHINING SYSTEM	LEXICAL DECODING	SYNTACTIC ANALYSIS

4. FIGURE OUT WHICH PHONEMES IS SPOKEN:

This is a quite dicey task as different words sound differently as spoken by different persons. Also, background noises from microphone make the recognizer hear a different vector. Thus a probability analysis is done during recognition. A hypothesis is formed based on this analysis. A speech recognizer works by hypothesizing a number of different “states” at once. Each state contains a phoneme with a history of previous phonemes. The hypothesized state with the highest score is used as the final recognition result.

5. WORKING OF VOICE RECOGNITION SYSTEM IN BIKE:

Here, we are using a voice recognition board, Transformer, Relay board, and Voice recognition that is used to save the programming, Transformer is used to covert (220 volt to 12volt), Bridge rectifier that is used to covert (AC to DC), Relay board that is used to convert the all signal to one signal and also if it is attached to the four wires to relay board (Here first two wire connected to the battery in that, one end connected to the (positive(+)) side and second end connected to the negative(-) side) and another two wire connected to the self-relay in that, one end connected to the self-relay positive and second end connected to self-relay negative. Here we are using laptop in that you have to put a visual basic software that is used to recognize the voice, How it is recognize the voice is you have to put a Headset in that you have to speak out in one word, here we are using a password is (ENGINE ON), If you on that software first it will be showing (NO MATCH), in that (If it is not showing(NO MATCH) You did not say any word, if you say any words it will not be showing any command in that, If you say correct word first will be recognize that word, then after it will be showing that word is correct or not.

A programmer can create an application using the components provided by the Visual Basic program itself. Over time the community of programmers has developed new third party components, keeping this programming language to modern standards. Programs written in Visual Basic can also use the Windows API, which requires external function declarations. Furthermore, new third party functions (which are open source) using part VB6 source code and part embedded machine code, make the Visual Basic 6.0 applications faster than those designed in C++.

From a programming viewpoint, Visual Basic is an object-oriented language that consists of two fundamental parts: a Visual part and a language part. The visual part of the language consists of a set of objects, while the language part consists of a high-level procedural programming language. These two elements of the language are used together to create applications. An application is simply a visual basic program that can be run under the window operating system.

6. CONNECTION OF VOICE BOARD WITH BIKE:

- Self-contained standalone speech recognition circuit- User programmable
- Up to 20 word vocabulary of duration two second each Multi-lingual
- Will keep the speech recognition data in memory even after power off.
- Easily interfaced to control external circuits & appliances.

7. MATERIAL USED:

S.NO	COMPONENT	MATERIAL
1	VOICE BOARD	CAST IRON
2	MICROCONTROLLER	52100 CHROME STEEL
3	CHAIN DRIVE	45MN STEEL
4	SPROCKET	A3 STEEL

8. COST ESTIMATION:

S. NO	COMPONENT	COST (IN RS)
1	VOICE BOARD	4000
2	MICROCONTROLLER	500
3	TRANSFORMER	200
4	RELAY BOARD	500
5	CONNECTING WIRES,ANALOG CABLE	300
6	PROGRAMMING	1500
7	EXECUTE	500
	TOTAL	7500

CONCLUSION:

Our project "Engine start feature using voice command" has been completed and testing is done.

The inclusion of our project is reducing the theft of the vehicle.

The addition of voice command in motor cycle is cost about RS.4000. This is quite economical and is easily affordable by all.