Voice Recognition

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Abstract: now a day's voice recognition application is more and more useful for people with physical disabilities who often find typing difficult, painful or impossible. Voice recognition software can also help those with spelling difficulties, including users with dyslexic, because recognized words are always correctly spelled. This project discusses the methodology for a process of voice Identification based automation system through speech recognition. Automation industry is growing rapidly; the central goal of design of speaker identification based automation is to provide an efficient and convenient integration and inter-operation in information gathering. Home automation systems must comply with the household standards and convenience of usage. The recognition of voice commands and microcontroller is used for processing. Based on the voice command some the applications are interfaced to it.

Keyword: ATMEL, Train, Voice, Embedded System.

I. INTRODUCTION

The Voice (speech) recognition approach is a thoroughly assembled and effortless to make use of programmable speech realization circuit. Programmable, within the feel that the phrases (or vocal utterances) you wish to have the circuit to respect may also be informed. This Programmable system on Chip (PSoC) established embedded procedure makes it possible for you to test with many aspects of speech attention technology. Some of interfacing applications that may be made are authentication, controlling industrial motors and for this reason many other instruments linked to it, controlling house appliances, robotics movements, and speech assisted applied sciences and many more.

Speech attention will develop to be the approach of choice for controlling home equipment, toys, tools and desktops. At its most simple measure, speech controlled home equipment and instruments enable the client to take part in parallel duties (i.e. Fingers and eyes are busy in one of a kind areas) even as working with the application or appliance. The centre of the circuit is the HM2007 speech attention IC. The

IC can recognize 20 phrases, each and every phrase a measurement of 1.92 seconds. This report is based on utilizing the Speech cognizance package deal SR-07 from portraits SI Inc in CPU-mode with an ATMega 128 as host controller. Troubles had been well-known when utilizing the SR-07 in CPU-mode. Also the HM-2007 booklet (DS-HM2007) has lacking/incorrect description of using the HM2007 in CPU-mode. This appendum is giving our experience in fixing the issues when working the HM2007 in CPU-Mode. [2][3]

Furthermore, Speaker Identification based automation is one of the major growing industries that can change the way people live with security in operation. Some of this home automation systems target those seeking luxury and sophisticated home automation platforms; others target those with special needs like the elderly and the disabled The aim of such Automation System is to provide those with special needs with a system that can respond to voice commands and control the on/off status of electrical devices, such as lamps, fans, television etc, in the home and office.

II. LITERATURE SURVEY

Rohita P. Patil et al [1] this paper proposes for The ARM based voice recognition module is used for voice recognition. Also some other techniques available for voice recognition are spectrum analysis using Matlab or readily available voice recognition module interfaced with ARM. The Purpose of using ARM is its high processing capacity, small size and low power consumption. A second level biometric identification is face recognition. A Matlab based Principal Component Analysis (PCA) and Adaboost Algorithm is used for face recognition. If both voice and face will be recognised then access will be granted to a particular person.

Sunpreet Kaur Nanda et al [2] Described the speech attention method is a totally assembled and easy to use programmable speech awareness circuit. Programmable, within the feel that the phrases (or vocal utterances) you need the circuit to admire will also be trained. This board allows for you to test with many aspects of speech cognizance technological know-how. It has 8 bit information out which can be interfaced with any microcontroller (ATMEL/PIC) for extra development.

Han Nilar Htay et al [3] Proposes for the primary proposal of this research is to approach analog voice sign. The paper is carried out for controlling the robot by means of voice command. The carried out system involves voice consciousness unit, digital information processing unit with DC switching part. The proposed procedure consists of a microcontroller and a voice cognizance processor that can appreciate a limited quantity of voice patterns. This is voice centered steering procedure, which uses the specific voice cognizance IC HM2007 for speech enhancement. It additionally generates special desired indicators in step with the spoken phrases which extra used to manage the motion of robot. The microcontroller used is PIC16F877A, to give the directions to the robotic for its operation. Backup energy is incorporated in this study to hold the voice commands at the same time the method is powered off. The R.F transmitter and receiver are used here, for the Wi-Fi transmission cause. The constructed procedure will also be commanded within the voice of English as well as Myanmar. [4]

Santosh K. Gaikwad et al [4] this method proposes for The Speech is most prominent & primary mode of Communication among of human being. The communication among human computer interaction is called human computer interface. Speech has potential of being important mode of interaction with computer .This paper gives an overview of major technological perspective and appreciation of the fundamental progress of speech recognition and also gives overview technique developed in each stage of speech recognition. This paper helps in choosing the technique along with their relative merits & demerits. A comparative study of different technique is done as per stages. [5][6]

III. PROPOSED SYSTEM

In this proposed system audio signal from the microphone will be input into the HM 2007 speech recognition chip. The HM 2007 chip will acquire the audio and determine if the commands are speech commands and valid then it will pass the commands through microcontroller. Microcontroller is used to process the voice command. A 16 x 2 LCD which interface with the microcontroller to display the valid is command fetched by the controller. And through serial communication data is sent to server. Based on command received required data like weather, traffic updating etc is fetched from the application.
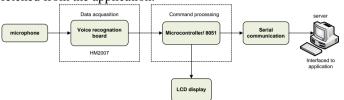

Figure 1: Architecture of Proposed System

A. MICROPHONES

MEMS microphones target all audio applications where small size, high sound quality, reliability and affordability are key requirements. Based on MEMS (Micro-Electrical Mechanical Systems) sensor technology, our microphones meet price points set by traditional electric condenser microphones (ECM), while featuring superior reliability and robustness. MEMS microphones from ST are designed using common techniques but also with industry-unique and innovative packaging that offers slimmer form factors and outperforms traditional devices. Both analog- and digital-input, top- and bottom-port solutions are available. Their best-in-class SNR makes ST's MEMS microphones suitable for applications beyond typical consumer applications, such as photometers and sound level meters that require a high dynamic range. [7]

B. VOICE RECOGNITION USING HM2007

Figure 2: HM 2007 Module

It is a practical voice recognition system that is easy to train and implement. It means that the circuit will recognize the words when we train it by giving voice commands.

It is a single chip CMOS voice recognition and identification LSI circuit with the on-chip analog front-end, voice analysis, recognition process and system control function A 20 isolated word voice recognition system will consists of small external microphone, 4x4 keyboard, 8K Static RAM memory and two 7 segment LED display units along with driver IC's are combined with a microcontroller, an voice recognition system can be built. It supports two control

modes: Manual mode (automatic mode) and CPU mode. It is also available in 48 -pin PDIP package. The pin description of HM2007 is shown above figure. The keypad and digital display are used to establish communication with and program the HM2007 processor. The keypad is made up of 12 normally open (NO) momentary contact switches. The 74LS373 8-bit registers feature 3- state outputs designed specifically for driving highly capacitive loads or relatively low-impedance loads. The high- impedance 3-state and increased high-logic-level drive provide these registers with the capability of being connected directly to and driving the bus lines in a bus-specified system without need for interface or pull-up components.

C. 8051 MICROCONTROLLER

It is 8-bit microcontroller, means MC 8051 can Read, Write and Process 8 bit data. This is mostly used microcontroller in the robotics, home appliances like mp3 player, washing machines, electronic iron and industries. Mostly used blocks in the architecture of 8051 are as follows: [8]
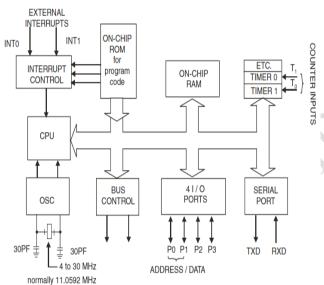

Figure 3: 8051 architecture

Image some kind of dilation is done to get proper circular dot present in the Braille character. Orientation of image is also adjusted for proper alignment of the scanned Image.

$$Grayscale = ((R + G + B)/3) \qquad (1)$$

D. 16X2 LCD DISPLAY

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

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LCD COMMANDS

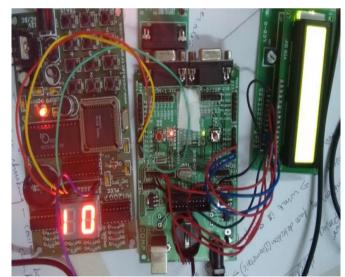| Instruction	Decimal	HEX
Function set (8-bit interface, 2 lines, 5*7 Pixels)	56	38
Function set (8-bit interface, 1 line, 5*7 Pixels)	48	30
Function set (4-bit interface, 2 lines, 5*7 Pixels)	40	28
Function set (4-bit interface, 1 line, 5*7 Pixels)	32	20
Entry mode set	See Below	See Below
Scroll display one character right (all lines)	28	1E
Scroll display one character left (all lines)	24	18
Home (move cursor to top/left character position)	2	2
Move cursor one character left	16	10
Move cursor one character right	20	14
Turn on visible underline cursor	14	0E
Turn on visible blinking-block cursor	15	0F
Make cursor invisible	12	0C

IV. RESULTS

Figure 4: Hardware Setup

V. CONCLUSION

According to this paper aims to identify a person through Voice and face recognition, and The ARM based voice

recognition module is used for voice recognition. Also some other techniques available for voice recognition are spectrum analysis using Matlab or readily available voice recognition module interfaced with ARM. The Purpose of using ARM is its high processing capacity, small size and low power consumption. A second level biometric identification is face recognition. A Matlab based Principal Component Analysis (PCA) and Adaboost Algorithm is used for face recognition. If both voice and face will be recognized then access will be granted to a particular person.

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