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INTELLIGENT MUSIC PLAYER WITH ARM7

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Abstract—**The usual search options provided in music player are very less in number.In this paper,the number of options for accessing the music player are increased.The ARM 7 Microprocessor is used to perform the control operation.Here speech recognition and touch interface are used to access the music player.This is beneficial to people in many ways.**

Index terms: **Music player, Speech recognition, touch interface, ARM7**

I. INTRODUCTION

Music players navigate through the database of songs through forward and backward movement. Forward and backward movement for navigating through a database of thousands of songs is cumbersome.The goal of this project is to add an search option based on number of the touches in touch pad and also to use voice recognition module to select songs. This can be used by a visually blind person as well as a driver in an automobile to avoid accidents because of driver's diversion of concentration. The various music players make use of different interfaces which makes them desirable to work with, but the visually challenged people require a different user interface which will make it easy for them to access the songs, normal music players are provided with user interfaces like keypad with buttons which will make it bulky, unattractive. The users will access the songs by seeing the display. This makes the music player inaccessible to visually impaired as they can't see the display.

II. RELATED WORK

Most of the existing music players support controls such as play/pause, next song/fast-forward, previous song/fast-reverse, and volume up/down. iPod Shuffle also supports a "shuffle" mode to play a randomly selected song. Sansa Clip supports browsing lots of songs. Milestone 312 supports a feature called "Speakout" which associates a recorded message with an RFID tag so that the user can hear this message whenever the corresponding tag is scanned[1].If a number of songs are shortlisted, then the only option for a user is to step through the songs sequentially.When other techniques like tooth-touch sound are used to select songs it might be affected by noise[2]. All these music players use keyboard and display interfaces through which songs are selected, which is practically impossible to be used by visually blind people.

In this paper we can sort the songs futher and easily selected using touch pad and voice recognition module.In implementation, the project makes use of the following components: (a) ARM7 microprocessor (b) Voice recognition module and (c) Touch pad. The new user interfaces can be used by visually challenged people and songs can be sorted in an easy manner without seeing them.

III. PROPOSED DESIGN

The proposed design consists of ARM7 microcontroller interfaced with touch pad interface and audio recognition module.The controller is interfaced with audio player and songs are sorted through touch pad and audio input interface..The communication with voice recognition module occurs through UART interface.Peripherals are connected to the CPU using data, address, and control buses, and can be handled with all instructions. Each instruction can operate on word and byte data. The Fig 1 shows the ARM7 controller is interfaced with touch interface, voice recognition system and audio player to process

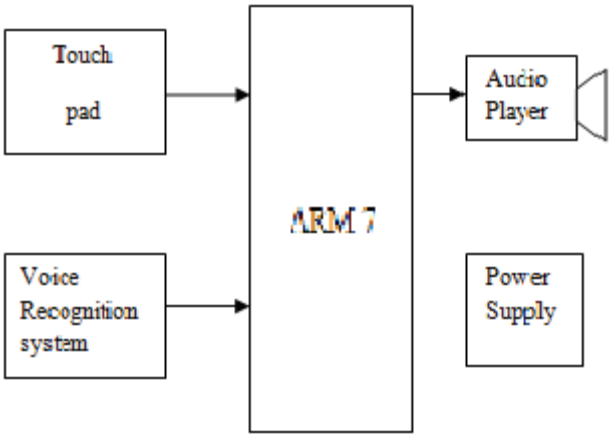

Fig. 1.Block diagram

voice commands and touches and based on that, it sorts songs in music player.

The Fig 2 shows the ARM7 processor portable measurement applications.

Fig. 2.ARM 7 processor

IV. SORTING SONGS BASED ON TOUCHES

The Audio player module has songs. The touch pad section consists of five touch pads. Two Touch pads are used to sort songs based on alphabets. When fifth touchpad is touched, songs in alphabet 'A' will be selected and all songs in 'A' will be played sequentially. When fifth touchpad is touched second time it will sort songs in 'B' and so on. When fourth touch pad is touched songs will be sorted in decrementing order, from 'Z' to 'A'.If the number of matches is zero, a message that there are no audio files by the artist is played on the player.i.e., When no songs are present in a particular alphabet feedback called "Not Available" is obtained.

If the number of matches is greater than 1, the user is given the option of playing all the songs by the artist or other searches. This narrow down the search.Using touch screen visually challenged people can easily access the songs in music player. Singer name, Artist name and Track name are used to sort songs.The song can be sorted in voice recognition module by giving the artist name,movie name or mood.In this project the Singer name, Artist name and Track name are used to sort songs and audio feedback for specific options which helps visually blind people.

The fig.3 shows the touch pad module consists of five touch pads, each when pressed produces Electro Magnetic field, the generated field produces voltage which in turn gives input to Transistor which triggers the IC555 which controls the timing delay. The output transistor acts as switch and sends the signal when IC is triggered to ARM 7 processor. The ARM 7 processor determines which touch pad is touched based on obtained signal from transistor and plays the selected song in audio player.The time delay may have to be adjusted by varying PT to compensate for the wide tolerance of electrolytic.An important feature to be noted here is that 555, unlike many RC timers, provide a timed interval that is virtually independent of supply voltage Vcc. This is because the charge rate of C and the reference voltages to the threshold comparator and trigger comparator are all directly proportional to the supply voltage. Operating voltage can range from 3V to 18V.The touch pad uses monostable mode with output pulse width of time *t*, which is the time it takes to charge C to 2/3 of the supply voltage, is given

$$t=RC\ln(3)=1.1RC$$

Where t is in seconds, R is in ohms (resistance) and C is in farads(capacitance).While using the timer IC in monostable mode, the time span between any two triggering pulses must be greater than the RC time constant.

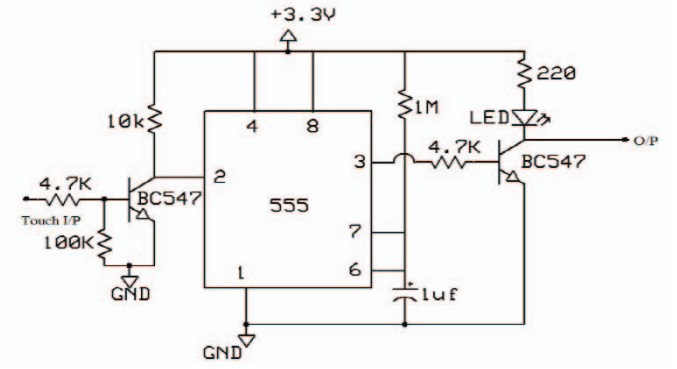

Fig. 3.Touch pad IC555 module

The songs will be sorted in alphabetical order in decrementing order. When fourth touchpad is touched and particular alphabet is selected it can be decremented to the before alphabet. Similarly when fifth touch pad is selected and particular alphabet is selected it can be incremented to play song in next alphabet. Also the songs can be sorted using audio recognition through which songs are played by choosing Artist name, movie name, mood, name of the track also provides audio feedback for specific options which helps visually blind people.

The ARM7 has a UART interface through which it receives input signal. The ARM7 controller is programmed to perform further operations to select song based on audio input.

The Fig 4 shows the way of transmission of audio input signal received in real time by voice recognition module which does the speech processing by comparing trained signal with real time input.

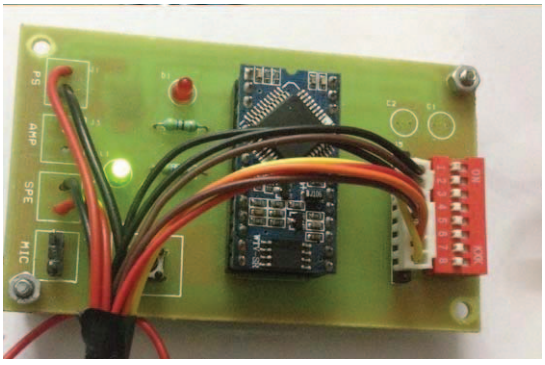

Fig. 4.Audio player

The Fig 4 shows the audio player module which has DIP switch that enables input signal which is sent from controller to audio player.The audio player plays the song when input signal is obtained from controller through voice input or touch.For recording the voice commands we use Access port Software

V. MODE SELECTION

The main difference between Compact Mode and Common Mode is the returning message. Common mode response is long string but compact mode response is a byte. For example, after sending 0xaa04 to delete all the contents of the 3 groups, in Common Mode it will return "All Groups Deleted! \ n", but in Compact Mode it will return a concise bytes such as 0xcc which means a successful operation. If voice instruction is recorded, each time after you power it on, you need to import the group before letting it identify voice instructions. The software is used to record songs in audio player

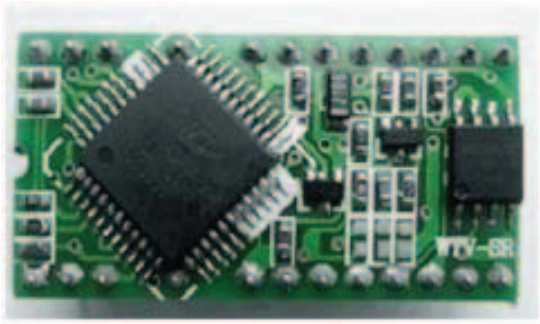

Fig. 5. WTV-SR and WTV080-44F2 IC's

The audio player has WTV-SR and WTV080-44F2 IC's are shown in Fig 5.

The songs are stored in audio player by the use of WTV-SR Voice Chip Beta1.3.Here importing the group before identifying voice instructions is necessary.

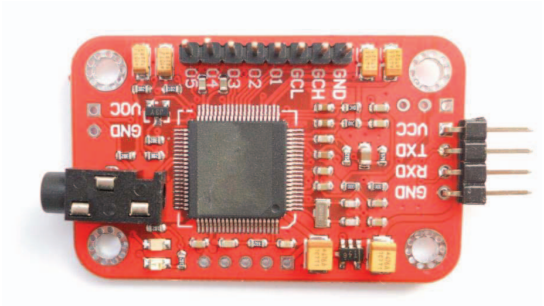

Fig. 6. V2 Voice recognition module

The Fig 6 shows the voice recognition module which does the audio processing.

VI.TRAINING COMMANDS

Before using it, we have to train it by recording voice instructions. The Fig 7 shows the training of commands. Each voice instruction has the maximum length of 1300ms, which ensures that most words can be recorded. Once you start recording, you can't stop the recording process until you finish all the 5 voice instructions recording of one group. Also, once you start recording, the previous voice instructions in that group will be erased.

The O1~O5 are pins which output the result of voice recognition. For example, if the first voice instruction in the working group is recognized, O1 could output HIGH signal.

VII. RESULTS

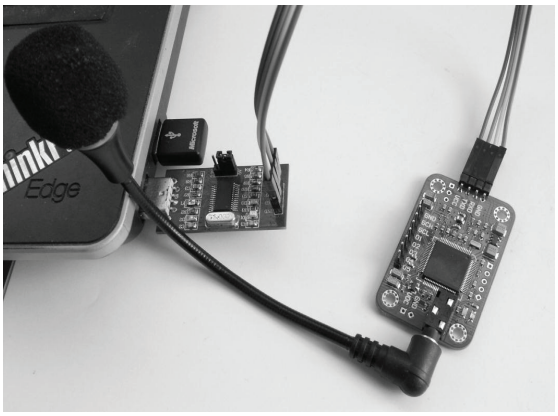

Fig. 7. Storage of Commands

The Fig 8 shows the storage of commands in Voice recognition module .This is done in command mode by repeatingly training the commands through speaker. After successful recording of commands it will be the terminal shows "successful".

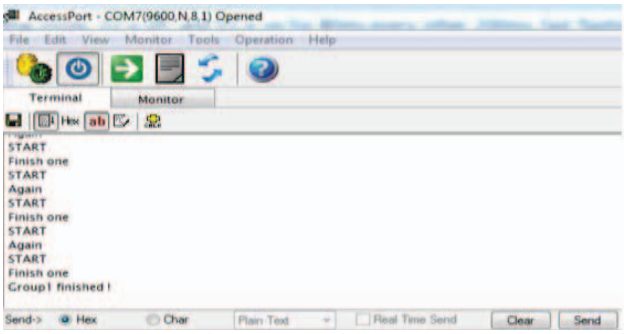

Fig. 8. Commands storage

The Table I shows the types of commands selected for each touch pad. If first touch pad is touched,lyrics or track is selected.If second touch pad is touched, composer is chosen. If third touch pad is touched,Artist name is chosen. If fourth touch pad is touched,songs are selected in decreasing ahabetical order. If fifth touch pad is touched,songs are Selected in increasing alphabetical order.

TABLE I.COMMANDS SELECTION

TOUCH PAD 1	TOUCH PAD 2	TOUCH PAD 3	TOUCH PAD 4	TOUCH PAD 5
lyrics	composer	Artist	Decreasing Alphabetical order	Increasing Alphabetical order

VIII.CONCLUSION

Intelligent music player with voice recognition and touch interface is implemented. This project eliminates the need for display, since songs are selected by means of voice commands and touch pad. While several kinds of audio players are available in the market,they have drawbacks(i.e).,visually impaired users will find it difficult the user interfaces provided in normal music players.The usual way of navigation through songs will make it difficult if large number of songs are provided.

This project features an audio player with a special mode for visually impaired users.Also this music player will assist the drivers in vehicle during driving by helping them to select songs without viewing the display screen,thus preventing accidents.This overcomes the disadvantage of other audio players by providing search option in an easy manner.

IX.FUTURE WORK

In this project,the implementation have songs in memory of audio player which is a small memory.In future methods can be developed to store songs in large memory through which large number of songs can be stored.Also the selection commands can be stored in large command database so that large selection is possible.

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