Universal Sound Recorder using ARM 9: A Review

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Abstract— Number of sound recorders are present in market now days, but existing sound recorders have some trouble with battery life, transfer of recorded file to multiple users & in addition there is no such sound recorder which will provide facility of recording data remotely. The paper gives review of the digital sound recorder designed using ARM 9 processor which will overcome all these troubles & will be able to record sound along with storing that audio file in S.D. card as well as to U.S.B. devices connected. Also we can record & transfer audio file remotely by using this universal sound recorder.

Key words: ARM 9 processor, S.D. Card, remotely record

I. INTRODUCTION

Sound recording is basically an inscription which is either electrical or mechanical & is recreation of sound waves such as words spoken, a song, music or any sound effects.

Digital recording & with the help of recreating analog sound signal picked up by microphone converted to digital form by a process of digitization, allows it to be stored & transmitted by wider variety of media. If comparison is done, digital recordings are found to be better just not because they have higher fidelity but because in digital recording losses are minimized which are found in analog recording due to noise & electromagnetic interference[1].

The ARM 9 based embedded system comes with features such as high performance, low cost and low power consumption. So the arm microprocessor is used in the embedded system for number of applications. The ARM 9 supports Linux based systems, which has advantages of stability ,fastness, security & adaptability. High security levels are also ensured. ARM-based embedded system has performance much better; hence, it's use is in large extent.

The purpose of this review paper is to give solution based on ARM 9 platform with various functionalities like record sound, storing the audio file in S.D card as well as at the same time transfer it in U.S.B. devices. Now a days there are number of Sound recorders present in market. Today to have the broadcasted audio file is necessary thing in classrooms, meetings, conferences, etc. For that previously there was need to have individual sound recorder with each individual to record that data but by using this sound recorder, multiple users can have this data just by connecting their U.S.B devices to recorder. Additionally to record data remotely is one of the unique application of this recorder. User can record data remotely & will be able to transfer that audio file too. It will be possible for user to address more than one places at the same time & that data can also be recorded. This feature will prove useful in academics, I.T. industries as well as for professional singers also. By using this feature we can get recorded data at any remote place even if speaker is far away & the data obtained will have same quality like if sound is recorded when speaker is actually present at that place. Quality of sound recorded will not be affected due to remotely recording of audio file.

II. BACKGROUND

A. Recording & Storing Audio File:

Using ARM 9 processor, sound is recorded. Mic is provided to user with the help of which user can record sound. Later this recorded audio file is stored in internal memory of Arm processor. The recorded audio file will be in .wav format. Now this recorded file should be transmitted to S.D. card & U.S.B. devices.

B. Transfer of Recorded File into S.D. Card & U.S.B. Devices:

Simply nothing can be seen in S.D. card. Since, fusing should be done. Fusing is nothing but writing some boot codes into boot sector of S.D. card. However, it will work well only when S.D. card is put into S.D. cartridge on the board, the board boot switches are set on in appropriate positions & device is booted up.

Same as in case of U.S.B devices, booting should be done & after successful booting, data can be transferred to both S.D. card & U.S.B devices successfully.

The audio file recorded & transmitted will be in .wav format. Even if user is not having his individual sound recorder, recorded audio file can be transmitted to U.S.B devices & user can have recorded audio files.

C. Remotely Transfer of Audio File:

Though speaker is not present at the place where data is to be recorded, it can be recorded remotely. This feature will be very useful where speaker is at remote place & from that place he will be able to record that data & that audio file at the same time can be stored in multiple U.S.B devices.

III. LITERATURE SURVEY

This section focuses on some of the existing sound recording techniques based on different platforms. Hong Zhao and Hafiz Malik [3] stated Audio Recording Location Identification. As audio recording is supposed to be subjected of number of possible distortions. Majorly artifacts considered here are background noise & acoustic reverberation. Smilen Dimitrov [4] Demonstrated Arduino Duemillanove board Which do not have mp3 player or recording medium but a USB interface chip, they have given the soundcard interfaces with various audio equipments.

Ki-Man Kim , Young-Keun Choi [5] proposed latest approach for cancellation in pen-type voice recorder .A signal subspace approach method is proposed.They achieved a saving on computational
complexity using subband domain processing. Zhi Yang, Qi Zhao [6] proposed vivo neural recording in which they have studied multiple noise sources for in vivo neural recording.

Seon Man Kim, Chan Jun Chun [8] proposed multichannel audio recording. In this paper, an audio recording method is given in which a near-coincident microphone array is used for a multichannel audio system. To capture spatial microphone recordings in which a coincident or near-coincident method attempts images in a multi-channel audio system depending on directional-level differences or directivities.

There are number of digital sound recorders present in market now-a-days. Following chart shows comparison of portable digital audio recorder.

Recorder	Pros	Cons
Olympus LS-10	– Size – Easy to use – Audio Quality – Internal memory	– Awkward menu interface – Flimsy covers for USB port.
Sony PCM-D50	– Rugged & Ergonomic – High audio quality	– Havier than competition. – Cannot record mp3.

Table 1:

IV. CONCLUSION

In this paper, we have discussed sound recording technique using arm 9 processor. Along with recording the sound, audio file is transmitted to S.D. card & U.S.B devices. The reason for using S.D. card here is mainly for it's various advantages like low power consumption, enough capacity for all kinds of multimedia data. Data transfer to multiple users & remotely recording of data are main advantages of proposed digital sound recorder over other sound recorders present in market.

REFERENCES

[1] Stojan Mateski, Zoran Anastasovski" Digital Sound Recorder with ARM microcontroller and SD Card" 20th Telecommunications forum TELFOR 2012.
[2] Smilen Dimitrov, Stefania Serafin "Audio Arduino - an ALSA (Advanced Linux Sound Architecture) audio driver for FTDI-basedArduinos"International Conference on New Interfaces for Musical Expression, 30 May - 1 June 2011.
[3] Hong Zhao and Hafiz Malik "Audio Recording Location Identification Using Acoustic Environment Signature" ieee transactions on information forensics and security, vol. 8, no. 11, november 2013
[4] Ki-Man Kim , Young-Keun Choi, and Kyu-Sik Park "A New Approach for Rustle Noise Canceling in Pen-type Voice Recorder" IEEE Transactions on Consumer Electronics, Vol. 49, No. 4, NOVEMBER 2003.
[5] Zhi Yang1, Qi Zhao2, Edward Keefer3;4, and Wentai Liu "Noise Characterization, Modeling, and Reduction for In Vivo Neural Recording"
[6] Yiteng (Arden) Huang, Jacob Benesty, Jingdong Chen," Analysis and Comparison of Multichannel Noise Reduction Methods in a Common Framework", ieee transactions on audio, speech, and language processing, vol. 16, no. 5, july 2008.
[7] Seon Man Kim, Chan Jun Chun, and Hong Kook Kim" Multi-Channel Audio Recording Based on Superdirective Beamforming for Portable Multimedia Recording Devices" 2014 .
[8] Sen M. Kuo, Bob H. Lee and Wenshun Tian, "Real-Time Digital Signal Processing," in Chichester, England, 2006.
[9] ARM Architecture Reference Manual, ARM Limited 2005.

