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ENHANCING ADAPTIVE NOISE CANCELLATION CIRCUIT USING LMS ALGORITHM AND CARRY SAVE ADDER

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ABSTRACT

Noise cancellation ear headphones (NCEHs) supplement the acoustic isolation characteristic of headphones with active noise reduction. By their nature, headphones block out some degree of external noise because the ear cups absorb it. The Active noise control is an efficient technique to deal with low frequency noise. many successful active noise cancellation system have adapted the feed forward filter is used to reduce the broad band noise of the data input with noise model. Increasing efficiency and throughput of the data output by using carry save adder and ROM.

1.INTRODUCTION

The goal of active noise cancellation (ANC) is to reduce the amplitude of the sound v pressure level of the noise incident on the receiver or ear by "actively" introducing the secondary, out-of-phase acoustic field, “anti noise”. The resulting destructive interference pattern reduces the unwanted sound. Over the past two decades, significant advances in control theory and the development of flexible, programmable, high-speed digital signal have made it possible to model and implement more complex active noise control systems. ANC is based on either feed forward control or feedback control. In feed forward control,a reference input

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coherent with the noise is sensed before it propagates past the secondary source. In feedback control, the active noise controller attempts to cancel the noise without the benefit of an "upstream"

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reference input. Structures for feed forward ANC are classified into broadband adaptive feed forward control with a control field reference sensor, narrowband adaptive feed forward control with a reference sensor that is not influenced by control field. Feed forward ANC is generally more robust than feedback ANC particularly when the feed forward system has a reference input isolated from the secondary anti noise source.

2. ACTIVE NOISE CANCELLATION OVERVIEW

All sounds are transmitted in waves described in terms of amplitude,wavelengthand frequency, ANC removes unwanted sounds well preserving the original audio signals. If usually built directly into the headphones. A microphone picks up the ambient noise and transmit through the way of ANC there an identical 180 degree inverted waveform generated and send back to the headphones speakers. The result that the ambient noise wave and newly created waveform cancel each other. Upcoming these cases have two types of controlling the noise.

Need a power source to reducing the noise source and more effective to the lower frequency using more technologies implemented in the headphone.

3. NOISE CANCELLATION USING LMS ALGORITHM

The least mean squares (LMS) algorithms adjust the filter coefficients to minimize the cost function. Compared to recursive least squares (RLS) algorithm, the LMS algorithms do not involve any matrix operations. Therefore, the LMS algorithms require fewer computational resources and memory than the RLS algorithms. The implementation of the LMS algorithms also is less complicated than the RLS algorithms. However, the eigen value spread of the input correlation matrix.

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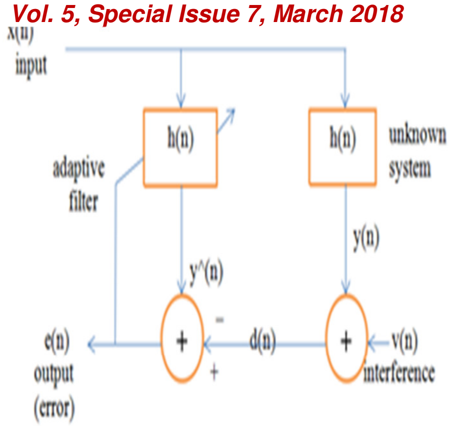

Fig:3.3. LMS Algorithm design

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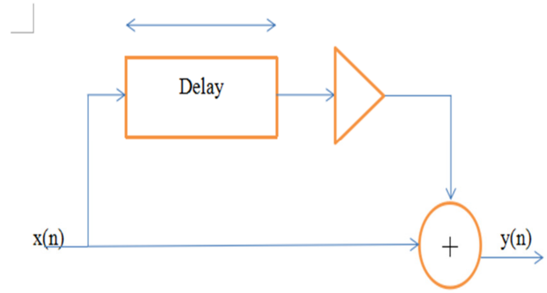
4.FEED FORWARD FILTER

Connecting two cables at an output of a module will create two separate signal paths coming from this output. This effectively splits a signal into two parallel signals, that at this point are exact copies of each other. The reason one might want to do so is to give one or both signal paths a different sonic treatment. After these sonic treatments the two manipulated signals can be mixed together again. The final result will be an effect that is a combination of the two effects applied to the signal after it was split up into the two copies.



5.CARRY SAVE ADDER

A Carry-Save Adder is just a set of one-bit full adders, without any carry-chaining. Therefore, an n-bit CSA

receives three n-bit operands, namely A(n-1)..A(0), B(n-1)..B(0), and CIN(n-1)..CIN(0), and generates two n-bit result values,SUM(n-1)..SUM(0) and COUT(n-1)..COUT(0).

Themost important application of a carry-save adder is to calculate the partialproductsin integer multiplication. This allows for architectures, where a tree of carry-save adders (a so called Wallace tree) is used to calculate the partial products very fast.One 'normal' adder is then used to add the last set of carry bits to the last partial products to give the final multiplication result. Usually, a very fast carry-lookahead or carry-select adder is

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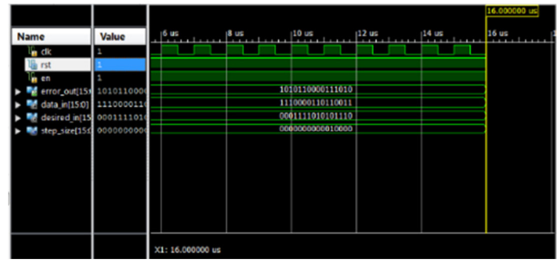
used for this last stage, in order to obtain the optimal performance.

6.GAUSSIAN NOISE

Gaussian noise is statistical noise having a Probability density function equal to that of the normal distribution, which is also known as the Gaussian distribution.In other words, the values that the noise can take on are Gaussian-distributed

7.RESULT AND ANALYSIS

The upcoming signal values which are developed by the xillinx and implemented function whether uses the implementation. or uses the simulation process the maximized level of data source values used the several inputs and desired output which is called as a data out. These values are stored in the ROM. That helps to generate the output in high efficiency, the values are approximately calculated and it provides by the waveforms are generated in the xillinx tool used.



8.CONCLUSION

Using the circuit which is called active noise cancellation designed and executed successfully the result shown in xillinx and verified an digital waveform.

To reduce the noise in the desired function have to hold that the proposed design systems.

The design had coded in the Verilog and to be implemented in the xillinx14.2. It has more speed and less power consumption.

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