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An Adaptive Noise Cancellation Using Wavelet Based Grazing Estimation of Signal Method

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ABSTRACT:

This thesis introduce the reducing the content of noise present in the received Speech signals for wireless communication medium by using Wavelet based Grazing Estimation of Signal (WGES) Method. Due to mixing of white Gaussian noise, the received signal is degraded. This proposed method is designed based on the wavelet transforms techniques with compare the available control algorithms output error signals. Compared to other available control algorithms the proposed method is Simple to implement, yields good performance and converges quickly. This proposed technique is implemented using Matlab software and DSP processor. This computer output simulation results confirm the effectiveness of our proposed algorithm.

Key-words:

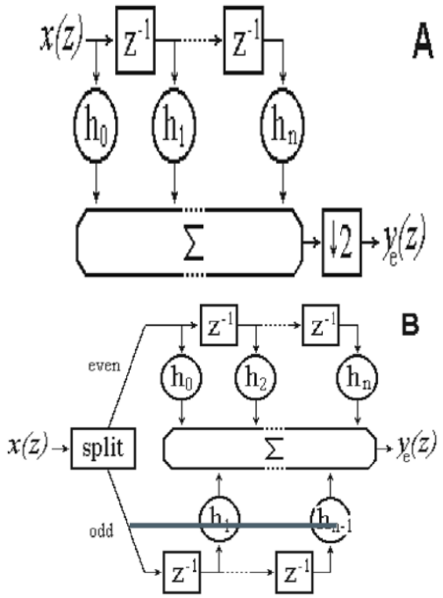
ANC, SNR, MATLAB6.5, LMS, RLS Algorithms, Grazing Estimation Method, Wavelet.

1. INTRODUCTION:

This paper is about decreasing the substance of noise. To achieve perfect noise reduction from the wireless communication medium. In such a communication all the noise is added in the channel. The noise is highly random. Here there is no source for obtaining a correlated noise at the receiving end. Only the received signal can tell the story of the noise added to it This proposed method is designed based on the wavelet transforms techniques with compare the available control algorithms output error signals. Compared to other available control algorithms the proposed method is Simple to implement, yields good performance and converges quickly.

EMBEDDING GES WITH WAVELET TRANSFORM TECHNIQUE [WGES]

The purpose of preprocessing is to initially lower the noise level of yk while minimizing the distortion in sk, where (yk) denotes the output of this preprocessing stage [40]. The block diagram of denoising using wavelet is shown in Fig.



Block diagram of Wavelet Transform Technique

PROPOSED ALGORITHM

Step1: Initialization $SD(-1) = 5IP$ where 5 can be the inverse of the input signal power estimate

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Step1: Initialization $S_D(-1) = 5I_p$ where 5 can be the inverse of the input signal power estimate

Step2: $P_D(-I) = x('I) = [0\ 0.., 0]^T$

Step 3: Do for $k > 0$:

$$S_D(k) = \frac{1}{\lambda}\left[S_D(k-1) - \frac{S_D(k-1)x(k)S_D(k-1)}{\lambda + x^T(k)S_D(k-1)x(k)}\right]$$

$$P_D(k) = \lambda P_D(k-1) + d(k)\,x(k)$$

$$W(k) = S_D(k)P_D(k)$$

If necessary compute

$$y(k) - w^T(k)x(k)$$

$$e(k) = d(k) - y(k)$$

Here $\Psi(k)$ is an auxiliary vector required to reduce the computational burden defined by

$$Y(k) = S_D(k-1)\,X(k)$$

Further reduction in the numbers is possible if an additional auxiliary vector defined as

$$\phi(k) = \frac{\psi(k)}{\lambda + \psi^T(k)\,x(k)}$$

PERCEPTUAL WAVELET TRANSFORM:

A wavelet packet (WP) decomposition designed to mimic the critical bands as widely used m perceptual auditory modeling is utilized The implementation, first proposed by Black decomposition. This perceptual wavelet (PW) transform is used to decompose yk into subbands, threshold for the Gaussian white noise under 3 mean squared error criterion is used. However, in practice this threshold is not ideal for speech signals due the poor correlation between USE and subjective quality and the more realistic presence of correlated noise.

Here a new adaptive time-frequency dependent thresholds estimation method is used.

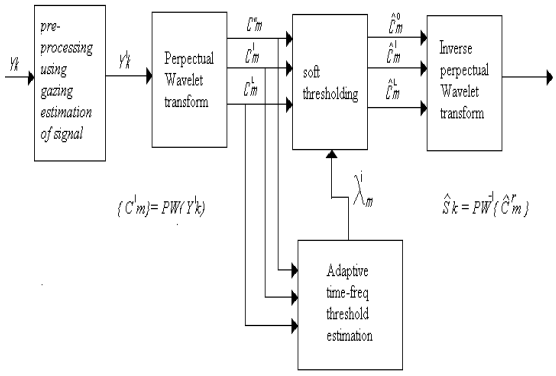

Fig 6.15 Block diagram of wavelet denoising

The purpose of preprocessing is to initially lower the noise level of yk while minimizing the distortion in s_k (y_k) denotes the output of this preprocessing stage. For this the grazing signal estimation method is Quintile-based noise spectrum estimator to track the slowly varying non-stationary noise statistics. Simulation results show that the grazing estimation of the signal technique achieves modern's levels of noise suppression.

SIMULATION RESULTS OF GRAZING ESTIMATION

The results from figure 5 shown on the performance of grazing estimation method and from figure 6 shows the comparisons

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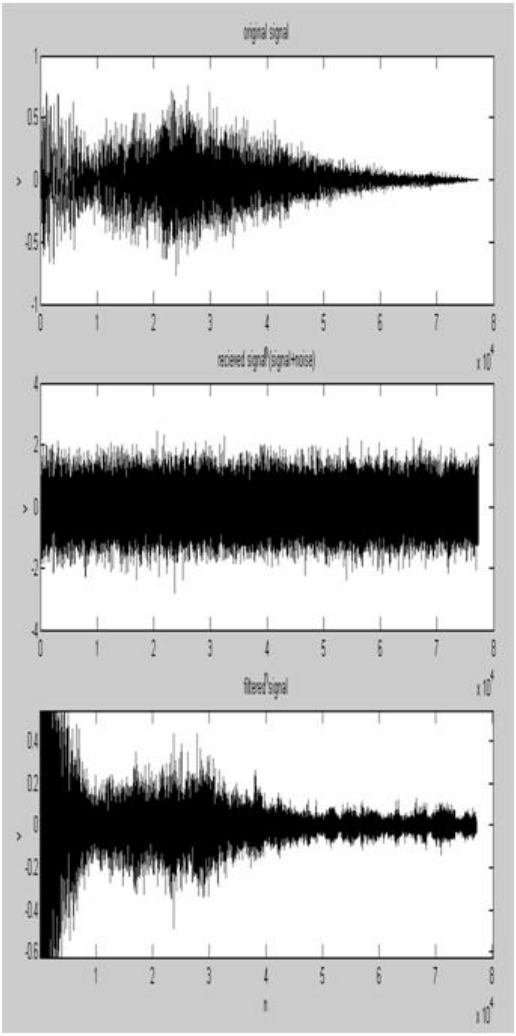
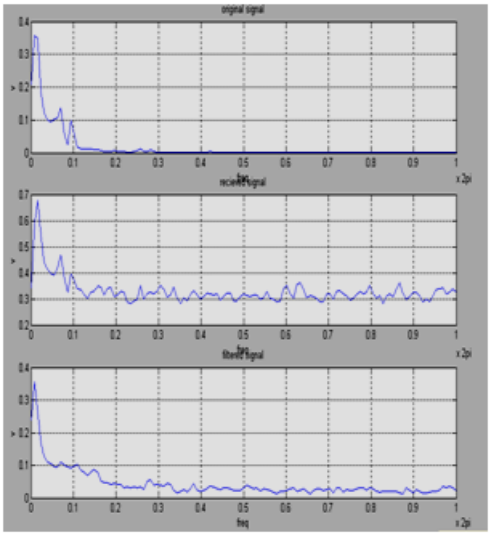
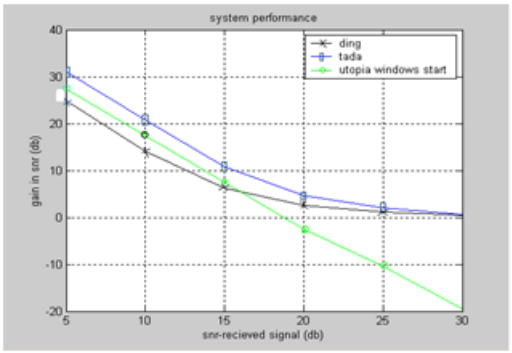


System performance in time domain



System performance in Frequency domain



Represents the gain in the PSNR

CONCLUSION AND FUTURE WORK:

This approach is along these lines extremely effective it is fell by other commotion decreasing techniques. As can be seen from the outcomes, that when this strategy was fell by wavelet de-noising technique it generally speaking was particularly enhanced the productivity of the blend was superior to when both of the methods were utilized separately. In this way the blend of this strategy with some broad known different techniques, gives the benefit of transmitting signs with low power, than required in the event that when the other strategy is utilized independently, and also improving the SNR to the required level, obviously, this will come at the cost of higher computational time. Along these lines on account of simple correspondence, this strategy can be utilized before the De-accentuation circuit at the less than desirable end. If there should arise an occurrence of computerized correspondence, blend of this strategy and the coordinated channel will work productively. Along these lines this technique is a productive route for pre-handling the got flag.There lie heaps of revealed potential strategies, which can make this strategy more independent. One such thing is a still productive method for assessing the flag. The above outcomes have through reenactment. The technique could be tried for constant circumstances utilizing DSP processors.

References:

1.IEEE Trans. On Neural N Woon S. Gan and Sen M. Kuo, “Integrated Headsets Using theAdaptive Feedback Active NoiseControl System,” in Proc.

Int.Congress on Sound and Vibration, July 2001, pp. 277-284.

2.Sen M. Kuo and D. W. Sun, "De-reverberation Using Frequency-Domain Center Clipper," in Workshop Record (CD-ROM), FA1.9, IEEE Workshop on Signal Processing Advances in Wireless Communications, March 2001.

3.Sen M. Kuo and Dennis R. Morgan, "Review of DSP Algorithms for Active Noise Control," in Proc. IEEE Int. Conf. On Control Applications, Sept. 2000, pp. 243-248.

4.T.G. Tsuei, Anu Srinivasa, and Sen M. Kuo, "Analysis of Adaptive Feedback Noise Control System," in Proc. IEEEInt. Conf. On Control Applications, Sept. 2000, pp. 249-254.

5. Sen M. Kuo, "Active Noise ControlSystems with the TMS320 Family," DSPSFEST 2000, DSP Technolog y and Education Conference, August 2000. NIU001 in conference proceeding CD-ROM SPRC045.

6. T.G. Tsuei, Sen M. Kuo, and Anu Srinivasa, "A New Adaptive Feedback Algorithm for Active Noise Control," in Proc. Int. Conf. Signal Processing Applications and Technology, Oct. 2000. In CD-ROM.

7.Sen M. Kuo and Wei M. Peng, "Asymmetric Crosstalk-Resistant Adaptive Noise Canceler," in Proc. IEEE Workshop on Signal Processing Systems, October, 1999, pp. 605-614.

8.Xuan Kong, Sen M. Kuo, Yuan Qiu, "A New Feedback Active Noise Control System with Adaptive Line Enhancer," in Proc. Int. Conf. On Signal Processing Applications and Technology, Nov. 1999, file 307.pdf in CD-ROM proceedings.

9.Sen M. Kuo and Yung-Jeng Yan, "Development and Implementation of Adaptive Echo Cancellation Techniques," in Proc. Fourth Int. Conf. Signal Processing, Oct. 1998, pp. 494-497.

10.Jeanine Z. Pan and Sen M. Kuo, Integrated Adaptive Noise and Echo Cancellation Microphone System," in Proc. Fourth Int. Conf. Signal Processing, Oct. 1998, pp. 461-464.

11.Sen M. Kuo, Xuan Kong, and Shaojie Chen, "Out-of-Band Overshoot in Narrowband Active Noise Control Systems," in Proc. Fourth Int. Conf. Signal Processing, Oct. 1998, pp. 474-477

12.Sen M. Kuo, Xuan Kong, Shaojie Chen, and Wenge Hao, "Analysis and Design of Narrowband Active Noise Control Systems," in Proc. IEEE Int. Conf. Acoust. Speech & Signal Processing, vol. VI, pp. 3557-3560, Seattle, WA, May 1998.

BIOGRAPHY:

Nahid Jabeen received M.Tech. in DSCE from JNTUH, and having more than 10 years of experience in both teaching and industry currently pursuing Ph.D and working as an Asst. Professor at NSAKCET, Hyderabad.