ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

Methodology for Adaptive Noise Cancellation for Speech Signals Using GES Method

Nahid Jabeen
Research Scholar,
Department of ECE
Sunrise University,
Alwar, Rajasthan.

Dr. Sachin Saxena
Supervisor,
Department of ECE,
Sunrise University,
Alwar, Rajasthan.

ABSTRACT

This paper 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 superposition principle with four possible cases. By conducting multiple possible cases of signal movement the noise signal is moved to opposite direction of original signal. This output is cascaded with wavelet transforms techniques with 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 explain the sign going over the medium gets undermined by clamor, which debases the sign quality. Aside from clamor, the sign experiences through parcel numerous debasing impacts that are inborn of the medium, which adds to flag debasement. These debasing segments are exceedingly arbitrary in nature. The sifting of the educational sign from this exceptionally defiled sign is a troublesome undertaking.

The versatile methods are productive in wiping out clamor when the reference commotion utilized is connected to the clamor undermining the sign. Subsequent to the clamor gets included the channel, and is absolutely arbitrary, henceforth there is no method for making an interrelated commotion, at the less than desirable end. Just way that is available is to extricate the clamor, from the got signal, itself, the got sign can say the Story of the commotion added to it.

The system utilized as a part of this paper is a two way prepare. As the initial step attempt to appraise a sign associated to the genuine sign i.e. in arrangement bearing segment of the got signal. The strategy utilized for this era is introduced. Subsequent to the sign and the commotion are non-lucid to one another, this sign is utilized to concentrate clamor from the got signal utilizing the obstruction cancelation strategy for the versatile sign handling, along these lines giving us clamor which to a decent degree will be corresponded to the commotion, in the got signal. A system to produce a sign corresponded to the real flag, which is consequently the preeminent stride in creating connected clamor, is displayed next.

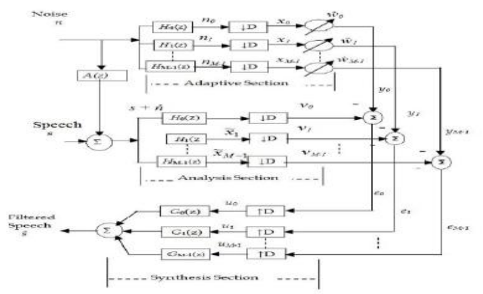

Fig 1.1 Proposed Method To Adaptive Noise Cancellation

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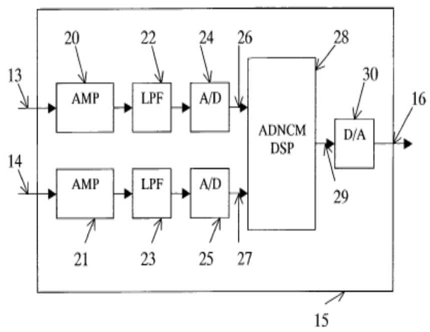


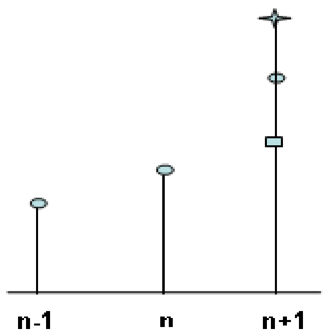
Fig 1.2 For Speech Signals Using Wavelet Based Ges Method

PROPOSED METHOD FOR POSSIBLE CASES

To see how the above system functions, let us consider the accompanying cases given beneath.

- Denotes the real specimen of the sign. Means the assessed test right then and there.
- Denotes the worth because of expansion of commotion right then and there i.e. it means the specimen of the got signal.

Case 1

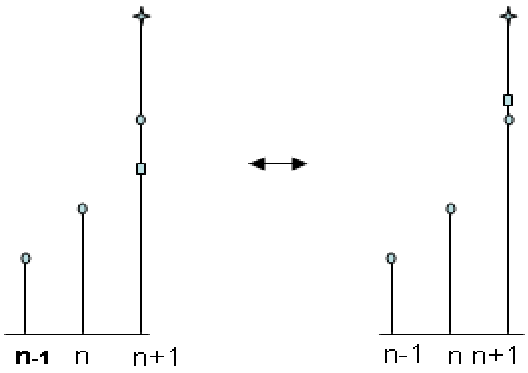


In the above case, see that the estimated falls below the actual value and the noise is positive.

Thus in this case the estimated signal, the actual value and the noise has the same sign. The estimated signal, clean signal (actual signal) value and the noise all are in the same direction.

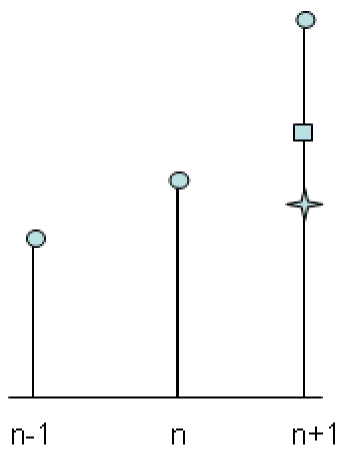
This implies that at $(n+1)^{th}$ instant, there is some level of correlation between them.

Case 2: This case is similar to case 1 except that the noise here is of high magnitude. Due to this, the difference between the received value and the estimated value happens to be greater than the threshold.



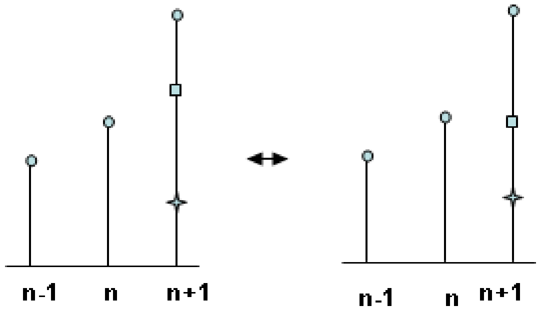
In this way the evaluated esteem must be balanced, as appeared in the figure above. For this situation we see that the spotless sign esteem, the evaluated signal worth and the got signal esteem all have in the same course. This as clarified on the off chance that 1, the evaluated sign is corresponded to both the spotless sign and the commotion at the (n+1)th instant[41].

Case 3



This case is like case 1, aside from that the clamor included at moment n+1 is negative. Again for this situation the evaluated signal and real flag have the same sign, and inverse to that to the commotion.

Case 4: In this case the noise is high negative, so that the difference between the estimated value and the received vale is more than the threshold. Hence we read just the estimated value.



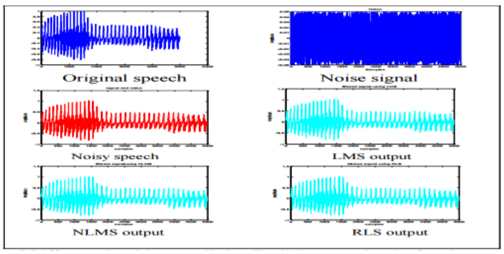
Presently we will consider situations where there is a change of slant between the (n+1)th and nth specimens when contrasted with that of in the middle of nth and (n-1)th examples. For this situation the commotion is sure, as appeared in the figure above. As can be seen, the assessed signal and the genuine sign and the commotion for this situation will be in the bearing.

Table 6.1 Algorithm Resource

	LMS	NLMS	RLS
Memory	2L+1	2L+7	L^2+2L+4
Multiply	2L	2L+7	$2L^2+4L$
Add	0	2L+2	$1.5L^2+2.5L$
Divide	0	1	L

Table 6.1 Algorithm Resource

Simulation result:



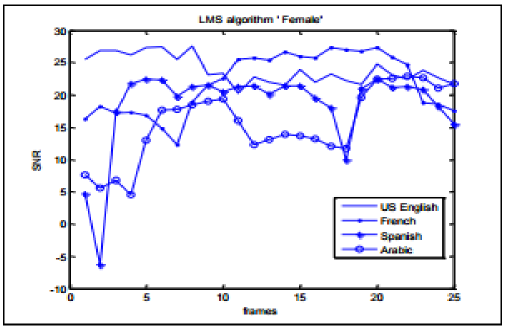


Fig.6.9 Segmental SNR for different languages (female) using LMS

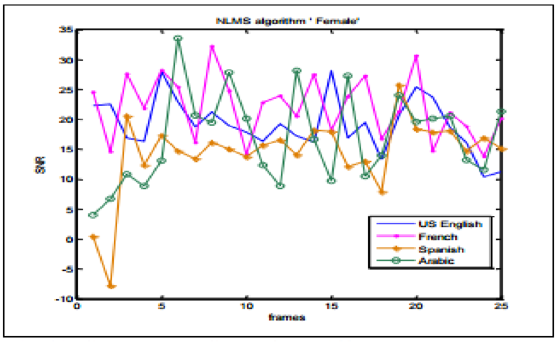


Fig.6.10 Segmental SNR for different languages (female) using NLMS

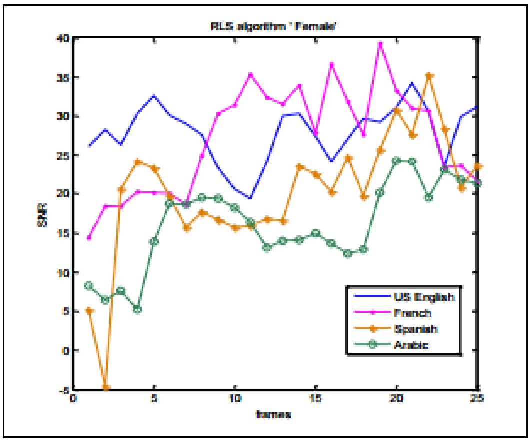


Fig.611 Segmental SNR for different languages (female) using RLS

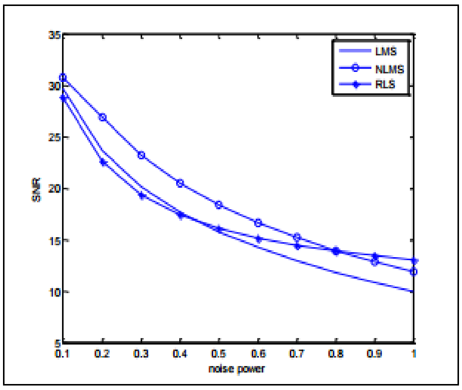


Fig. 6.12 Relation between noise power and SNR

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Author Details

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.

Dr. Sachin Saxena
Supervisor,
Department of ECE,
Sunrise University,
Alwar, Rajasthan.