

The Structure, Parameters, the Algorithm Adaptive Filters in Digital Signal Processing of Modern Telecommunication Systems.

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Annotation – This article provides some examples are given based on the work of adaptive filter algorithms are defined and their implementation schemes in information and computer systems.

Key words – AF - Adaptive Filter , WF – Wiener Filter, LSF- Least Squares Filter.

I. INTRODUCTION

Adaptive filter differs the following properties and its parameters: frequency response automatically adjusted and modified to improve performance and productivity of the filter according to some criteria that allow the filter to adapt to changes in input parameters. Such flexibility is available adaptive control and adaptive filters allows them to use in such diverse areas as telephone echo-suppression, signal processing in radar, navigation systems, alignment and effective communication channels allocation of biomedical signals.

II. ANALYSIS ADAPTIVE ALGORITHMS

In terms of computational complexity and memory requirements for the most efficient scheme is the least squares because it provides the highest stability and recursive least squares scheme has better convergence.

Will assess the adaptive noise-interference by minimizing the total power at the input noise-interference. Noisy signal can be represented as:

$$y_k = s_k + n_k \quad (1)$$

Тоді оцінка корисного сигналу буде :

$$\hat{s}_k = y_k - \hat{n}_k = s_k + n_k - \hat{n}_k \quad (2)$$

ALGORITHM FOR WIENER-HOPF

Many adaptive algorithms can be viewed as an approximation of the Wiener filter (WF) (Figure 1). At the same time filter and served two signals y_k and x_k . Usually y_k consists of a component that is correlated with x_k and components which are x_k not correlated. Wiener Filter gives an optimal estimate of that frequency y_k , which correlates

with x_k , and then subtracted from this estimate y_k , and receive e_k .

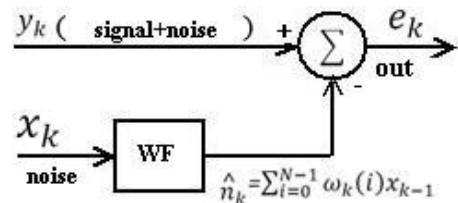


Figure.1. Wiener Filter.

RECURSIVE ALGORITHM LEAST-SQUARES

Recursive least squares algorithm based on the well-known scheme of least squares (Figure 2).

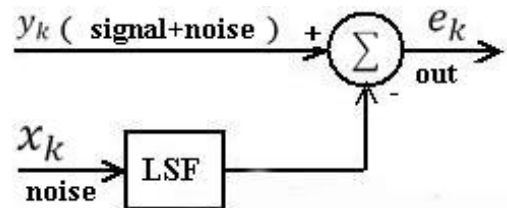


Figure.2. Scheme of least squares.
(LSF- Least Squares Filter).

III. CONCLUSION

The structure of modern adaptive digital filters for realization in information and computer systems. Certain algorithms for digital filters, which provide minimal error and high obstacle protection. Added some examples of modern systems of adaptive filtering in information and computer systems, telephony, teleconferencing, airborne radars.

REFERENCE LIST

- [1] Ifeachor, E.C.; Jervis, B.W.; Morris, E.L.; Allen, E.M.; Hudson, N.R. A new microcomputer-based online ocular artefact removal (OAR) system. *IEEE Proc*, 1986, №133-p 291-300.
- [2] Новосядлий С.П. Суб-наномікрона технологія структур ВІС *Івано-Франківськ Місто НВ* – 2010-456с.