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SPECTRAL ANALYSIS OF MEDICAL SIGNALS ON THE OF POLYNOMIAL WALSH BASES

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ANNOTATION

The problem of increase of productivity of the computer is one of the central problems of development of computer aids. Search of decisions of this problem goes in a direction of development of principles of parallel and conveyor processing of the medical information, including, constructions of structures specialized processors.

KEY WORDS: ***information, specialized processor, signal, functions Walsh.***

1. INTRODUCTION

The most perspective mathematical methods of increase of productivity of specialized processors of processing of signals concern such which would allow to use only linear arithmetic and logic operations. From this point of view most full satisfy the mathematical methods based on decomposition on systems of basic functions by Walsh. Presence of fast algorithms of calculation of spectral factors and realization of return transformations, sufficient convergence for technical appendices, possibility of reception of basic systems derivative of them by additional transformation, the prostate of an estimation of complexity of the scheme and its speed formed a basis for wide application of basis of Walsh in problems of digital processing of signals.

2. RELATED WORKS AND ITS PROBLEMS

The signals are arriving from gauges of various devices in a type of data about a condition and measurement of temperature, radiating, and electromagnetic, gravitational, thermal and other physical fields often are multidimensional and difficult. Problems of working out of algorithms for the express train of the analysis and the data processing, received with objects are actual, especially during ecological accidents. In the project these problems are solved.

Requirements of high efficiency of the computing systems applied in these areas can be satisfied as at the expense of development of new methods and algorithms of digital signal processing (DSP), and by means of multiprocessing means of in parallel-conveyor calculations [5,7]. The specialized computer [8] for performance of inverse Haar's transformation [1] of is known. The development purpose is device simplification. However, it possesses such lacks, as rather low speed, the limited functionality. In [9] the device is developed for orthogonal transformation of digital signals on Haar's [3, 4] functions. Lacks are also rather low speed, low accuracy of transformation.

The major problems are finding-out of thin structure of signals, fast revealing of local features, forecasting of development of processes and time aspiration to use of the limited number of processors of

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processing. The transition of piecewise-quadratic Haar's and Harmut's [1, 2] functions and development of the computing structures, which are carrying out transformations on piecewise-quadratic functions, it allows to improve accuracy of approximation, to reduce quantity of the factors necessary for approximation, and by that to save a memory size [4, 5, 6]. The various applications principle is paralleling increase of speed of specialized computing structures [5, 7]. On the basis piecewise-polynomial methods models of computing means to develop for use in future internet based applications.

3. OBJECTIVE STATEMENT

The main purpose of this project is to reduce the economic expenses of internet based applications using parallel-conveyor computing systems. To the limits of this project algorithm piecewise-polynomial signals processing from improvement positions of characteristics of computing means on their basis will be investigated, and also programs of their modeling and simulation will be developed for use in Internet based applications. The simulation and computing models is used program in MatLab and Simulink [3]. It offered set of models and means of signal processing on the basis of basic splines and fast spectral transformations is intended to use various applications[1, 2].

4. METHODOLOGY

The theoretical basis of the spent researches is made by the theory of the functional analysis, methods of splines-functions and modeling, variation and difference methods, methods of the numerical integration, the generalized spectral methods, the theory of numbers and matrixes, and also the theory of parallel computing processes.

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