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SYSTEM ANALYSIS, INFORMATION PROCESSING AND CONTROL

O.V. Faleev. PRINCIPLES OF IMPLEMENTATION OF PARALLEL PROCESSING MEASUREMENT INFORMATION

Key words: measuring information, parallel data processing, conveyor data processing.

The principles for realization of measuring information parallel processing are stated while creating difficult technical systems. The analysis for realization and its features of measuring information parallel processing are carried out3

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Key words: frames extraction, marker words distortion, marker word loss, false marker word, telemetry data.

This article represents an algorithm for frames extraction from the stream with registered telemetry data on the basis of analysis of information and marker words in case of their distortion. Also it provides a comparison between the proposed algorithm and the algorithm which does not pay attention to the possibility of marker words distortion. The article proves the usefulness of the proposed algorithm for selection of frames based on criteria of probability of marker words loss and probability of false marker words appearance. It shows that if three successive frames have been detected then probability of marker word loss is decreased on 0,22 (from 0,26 to 0,04) within probability of false marker word appearance as $2,79 \cdot 10^{-8}$ 9

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Key words: combined vision system, geometric transformations, image pyramid, image sequence.

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Key words: SAR data, interferometric processing, phase unwrapping, branch-cut method, minimum cost flow method, least squares method.

The problem of InSAR data processing at the stage of phase unwrapping is considered. Existing phase unwrapping methods, which are branch-cut, minimum cost flow and least squares methods, are analyzed. New phase unwrapping algorithm based on combining of existing methods is presented. It allows to reduce phase unwrapping errors in the cases where each method separately unwraps the phase with large errors.21

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Key words: on-board vision system, FPGA, multiple object tracking, bipartite graph.

This paper describes the implementation of the multiple targets tracking algorithm in FPGA-

based vision system. The goal of this work was to implement the described algorithm in small-sized on-board vision system based on the single Xilinx FPGA using MicroBlaze soft processor block. In the proposed implementation of this algorithm recursive procedures were replaced with table-based procedures. The experimental research of the algorithm shows 5 – 9 times increasing tracking performance over previously described hardware32

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Key words: interest point detectors, feature descriptors, image matching, calibration object, computer vision.

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Key words: state procurements, supportive process, institution of higher education, process approach, university management, purchase life-cycle.

The aspects of realization of important supportive business process «State procurements management» in the institution of higher education are considered. The features of state procurements procedure from the viewpoint of process approach are shown. The conception of purchase life-cycle is put into practice. The schemes of interaction and the description of high school state procurements management are also represented in this paper.45

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Key words: video information, playback speed, cognitive processes, adaptive processes, regression analysis, personification of display, display control unit, intelligent training system.

The work is carried out to develop control module personalized video display information in information systems. The basis of the module is the preferred regression model depending on the speed of video playback indicators of cognitive and adaptive processes and the strength of the nervous system, which coefficient of determination was equal to 0.89.50

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Key words: autocorrelation function, contour coherent filter, EEG fine structure, EEG segmentation, interrelation function.

The model of EEG as a vector in unitary space is offered. This vector approximates the line of EEG contour. The algorithm of conversion from real to complex EEG values is described. The benefits of the proposed model for processing EEG signals are shown. The concept of EEG fine structure as a set of impulses of bioelectric potential values is introduced. The EEG segmentation algorithm on separate pulses based on coherent filtering is invented.....56

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Key words: dynamic error of airborne measurements, digitizers, approximation, transition

functions.

Flight testing of aeronautical engineering represent comprehensive full-scale experiments in which the measurement of almost all parameters are made and the measurements themselves can be attributed to dynamic ones. Assessment of dynamic errors in the flight test is a rather complicated technical problem. Much more complicated situation appears with the assessment of performance and error-digital converters as they appear as a reaction device for speed (frequency) of the input signal change and depend largely on the principle and structure of the ADC used, CP, multiplexer and inertial properties.

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Key words: distributed systems, information-measuring systems, systems of gathering and measuring information, automatic measuring and control means.

The task of providing a measurement test of complex technical systems involves performing measurements on all plots of the experiment. In cases where measuring instruments are located at great distances from industrial and industrial facilities, there may be shortage of qualified personnel serving these measurement tools, or to identify the situation in which the presence of personnel in unsafe area measurements.

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Key words: transducer linear displacement; code scale; FPSS-line.

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Key words: transfer functions, linear circuits, topological modelling.

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Key words: ground modes of operation of the aircraft, automated system, expert system, system simulation.

The preconditions, methodological approaches and the ability to create an automated system of evaluation parameters of movement of the aircraft on the ground modes of operation based on the optimization of quality indicators are considered. A comparison of two approaches to the creation of given automated system is made. The expediency of establishing the system to estimate the parameters of movement of the aircraft on ground modes of operation based on the optimization of quality indicators is shown.....93

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Key words: measurement system, measurement function, experiment design, measuring chains interdependence.

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Key words: ring laser, inertial processes, impedance, positive column, two-arm discharge.

An experimental technique for recording the temperature dependence of linear response of symmetric two-arm DC discharges in a ring helium-neon laser on external harmonic disturbance is developed. The development of technology division of complex resistances of positive column and applied areas of glow discharge is carried out. The rapid growth of negative active component of complex impedance of a positive column in the frequency range above 30 kHz due to rising temperature is discovered. The result is interpreted as a consequence of the strong temperature dependence of excitation rate in collisions of metastable helium atoms with atoms of neon. The necessity to take into account the effect reported in choosing conditions for maintaining a discharge in ring lasers is shown115

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Key words: thyatron, inductive energy storage, current interruption, thyatron operational modes, off time, interruption time, interruption current, pulse voltage at the anode.

An experimental study of operating modes of a thyatron in the circuit with inductive energy storage was held. The dependences on the effect of operating conditions and parameters of the circuit at turn-off time of the thyatron were made. The pressure range under which stable thyatron undermines the current lies in the range between 30 and 60 Pa. The maximum current

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S.M. Karabanov, D.V. Suvorov, E.V. Slivkin, G.P. Gololobov, D. Yu. Tarabrin, M.A. Serpova, A.I. Moroz.
INCREASE IN EROSION RESISTANCE OF ELECTRODE AND GAS SWITCH GAUGE VACUUM COATING

Key words: MEMS, thermal field, thermomechanical stresses, erosion, modeling.

The paper presents the results of numerical simulation of thermo-mechanical stresses and thermal fields for conditions of erosion resistant coatings and vacuum discharge electrodes of switching devices with the structure of W-Ti-Cu and W-Mo-Cu in the local temperature and electro impact in axially symmetric approximation. Efficiency evaluation of the introduction of intermediate layers by comparing the interlaminar mechanical stress is given. The intermediate layer of Ti in the coating with a W-Cu structure significantly reduces the internal thermomechanical stresses between the layers, which increases the resistance of the coating to delamination. Optimal value of intermediate layer thickness providing minimum of thermomechanical stresses is detected..... 127

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Key words: point barrier contact, atomic force microscopy, conductive probe, semiconductor.

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Key words: solar module, electric double layer capacitors, battery, power.

The paper based on mathematical modeling contains the results of efficiency analysis of self-contained solar power systems using hybrid electric drives based on supercapacitors. The experimental data show that the use of supercapacitors as additional short-term storage of energy in autonomous solar-energy systems contributes to significant increase of accumulator lifetime and time of all system operation..... 137

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Key words: magnetron, sealed-off vacuum tube, electron scattering, residual gas pressure measurement, magnetic induction, crossed electric and magnetic fields.

The possibility of the pressure measuring was investigated in the magnetron with directly heated cathode based on the method of scattering electrons by gas molecules in the orthogonally crossed electric and magnetic fields at the magnetic field above the critical in the range between $10^{-3} - 10^{-6}$ mm Hg. It was shown that the dependence of the measured parameter informative pressure is near to linear one..... 143

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