C o n t e n t s

ELECTRONICS AND TELECOMMUNICATIONS

AUTOMATIC CONTROL AND COMPUTERS

ELECTRICAL ENGINEERING

POWER ENGINEERING

SURVEY

A DUAL TECHNIQUE FOR WATERMARKING COLOR DIGITAL IMAGES

Monica RADULESCU, Felicia IONESCU

The main requirements of a viable watermarking algorithm are: maintaining the host image quality and achieving a very high robustness to any kind of attacks for the introduced markup. In this paper, the authors propose a dual watermarking method. It combines a spatial watermarking technique with a frequency based technique. The two used methods have complementary results for image resistance to attacks. Since both watermarks are embedded in a different portion of the image coefficients, they do not interfere and the image quality is preserved. The resulting double watermarked image is extremely robust with respect to a wide range of attacks, including geometrical and non-geometrical transformations.

Keywords: watermarking, frequency transformation, attacks, robust message hiding, adaptability

ON SOME STATISTICAL INDICATORS OF THE TRAFFIC IN WIRELESS LOCAL AREA NETWORKS

Şerban Alexandru STĂNĂŞILĂ

In the last time, the protocol capacity of the wireless networks, for instance the throughput as allowed in a given wireless channel, plays an important role in the Internet applications. There are many theoretical models and variants to take into account the transmission delay due to collisions or to subsequent transmission. In this paper, one studies a model – based frame scheduling scheme, positioned between the layers of the logical link and medium access control (MAC) and give some statistical estimations regarding the expected values and the variations of some random variables, which describe the collisions

Keywords: transmission control protocol (TCP), medium access control, statistical indicators, performance evaluation.

DESIGN AND IMPLEMENTATION OF A DICTIONARY-BASED ARCHIVER

Radu RĂDESCU

This paper intends to present a common use archiver, made up following the dictionary technique. The original contribution of the paper resides in using the index archiving method. This archiver is useful in order to accomplish the lossless compression for any file types. The application can offer useful conclusions regarding the compression performances (compression ratio and packing time) and the influence of the chosen dictionary over the parameters.

Keywords: data lossless compression, dictionary codes, archive characters

INVESTIGATION OF THALAMUS ELECTRICAL STIMULATION EFFECTS ON BRAIN ACTIVITY OF COMA PATIENTS

Bareaa ZABACH, Sever PASCA, Jean CIUREA

In our experiment, EEG recordings were made before and after the application of electrical stimulation on patients in the vegetative state. The recordings were analyzed to help us to understand the changes in brain activities. Half of the patients showed higher energy level of the brain activities [1]. It seams like there are some centers on the brain cortex which indicates a higher sensibility for the stimulation. This study leads us to think that, if we can find an optimal combination between the waveform and the frequency of the stimulation, then we may be able to bring around the patient in coma.

Keywords: Brain stimulation, Thalamus stimulation, Vegetative coma.

MONITORING AND DIAGNOSIS METHODS FOR HIGH VOLTAGE POWER TRANSFORMERS

Ioana FĂGĂRĂŞAN, Sorina COSTINAS, Sergiu St. ILIESCU,

One of the most costly equipment in electrical power systems are the High Voltage Power Transformers (HVPT). Faults and failures for these equipments does not only cause repair cost, furthermore economic losses occur due to interruptions in consumers' energy supply. Preventive tests and on-line monitoring are used to predict incipient fault conditions, and to schedule outage maintenance and retirement of the transformers. This paper presents a survey on various approaches on monitoring and fault detection of electrical power transformers used to optimize maintenance techniques. This optimization is not possible without a correct fault diagnosis besides critical components and common failure modes knowledge.

A 3D VIRTUAL MUSEUM

Alin MOLDOVEANU, Florica MOLDOVEANU, Alexandru SOCEANU, Victor ASAVEI

The 3D virtual spaces are more and more used, from games to industry, medicine, military and science. Some of the most important applications are in e-learning and edutainment.

This paper presents the constituent elements and creation aspects of a "3D virtual museum", based on the authors experience with the development of "The Virtual Technical Museum of Vienna" software application. The application, which has been conceived by the authors together with specialists from the Technical Museum of Vienna, implements and enables the navigation into the virtual space of the museum. Now it is integrated in the museum's informatic system, extending it with new functionalities offered to visitors. The figures included in the paper are screen shots from the application's running.

SIGNAL COMPACTION BY MAXIMUM VERISIMILITUDE

Dan STEFANOIU, Janetta CULITA

Sampled data provided by a process are usually corrupted by various noises. Although data are required to be denoised before applying any further processing, the corrupting noises could encode a part of desired information. A partial denoising is suitable in this case, as part of pre-processing procedure. Another requirement frequently used in data pre-processing is to compress the useful information in a smaller number of data. Partial denoising and compression are gathered in the concept of "signal compaction". The paper introduces an original method for providing compacted preliminary data, relied on the concept of "verisimilitude" and requiring no synchronization signal accompanying the acquired data.

Keywords: time domain synchronous averaging, maximum verisimilitude

PERFORMANCE EVALUATION FOR DISCRETE EVENT SIMULATORS: OSSIM VS. OMNET++

Elena ULEIA

The objective of this paper is to present the runtime performance of the OSSim (Open Source Simulator) tool evaluation against a similar class simulation tool, the OMNeT++ tool (Object-Oriented Modular Discrete Event Network Simulator). In order to address this question, a number of performance evaluations for the high speed simulation runs have been conducted, by simulating a simple queueing system. The evaluation includes collecting performance data for both tools, checking the correctness of the analyzed performance data, and reporting the results.

Keywords: simulation, queuing systems, performance analysis, hierarchical models, performance analysis, distributed computing

DESIGN PROCEDURE FOR INVERSE MODEL COMMAND: CONTROL METHOD FOR NONLINEAR PROCESSES

Ciprian LUPU, Cătălin PETRESCU, Alexandru ȚICLEA, Cătălin DIMON,
Andreea UDREA, Bogdan IRIMIA

Structures with inverse model represent one of the successful solutions for the real-time control of the nonlinear processes. The use of these structures imposes solving some specific problems, like determination of static characteristic of the process, construction of inverse model or robust control law design. The paper proposes a structure and the correspondent original methodology of designing and physically implementation based on inverse model command. The applicability of the structure is proved using a real-time structure with an RST control algorithm. In the end, its software implementation and the obtained results are also shown.

FPGA INTEGRATED LOGIC ANALYZER WITH TESTING AUTOMATION FACILITIES

Laurențiu-Cristian DUCA

This paper presents an FPGA integrated logic analyzer. The logic analyzer is designed for in-circuit debug and verification of FPGA based applications. It has facilities for testing automation of the FPGA based applications and easy interfacing with third party protocol analyzers.

MATHEMATICAL MODELS USED IN QUALITY MANAGEMENT OF THE ELECTRICAL ENERGY

Petruta MIHAI, Mihai O. POPESCU

As part of this paper, the main purpose is to present the elaboration methodology of some forecasts in the energy consumptions area, using few mathematical models.

The forecast for energy consumptions I realised for a short period of time with a mathematical model, probabilist type, because the analysis is taken place from past to future and the independent variable is the time, and we consider that tha prognosis is direct.

The dates estimation and the forecast in a time series is made using the modeling methods will be discussed in this paper. We have elaborate using Matlab, the mathematical model for the forecast of the electrical energy consumption.

Keywords: Mathematical model, forecast, electrical energy, consumption, additive model.

ANOVA IN THE EDUCATIONAL PROCESS

Mihaela Florentina MATEI

Analysis Of Variance, ANOVA, represents one of the statistical procedure proceedings, the most powerful procedure for the observation dates. In the following case study, like an element of improving concerning the ANOVA studies, it is analyzed the homogeneity of the working groups of students referring at different disciplines (it is analyzed here the teaching process from teaching's or discipline's point of view and the differences who comes up at different disciplines like: electrical and economics).

Keywords: ANOVA, homogeneity, teaching process, normal distribution, Fisher test, educational process.

BIOMASS PYROLYSIS EXPERIMENTAL INVESTIGATIONS

Adrian BADEA, Cora GHEORGHE, Cosmin MĂRCULESCU, Eduard MINCIUC

One of the most important processes for the thermal-chemical conversion of the biomass is the pyrolysis. It represents the thermal degradation of the biomass in the absence of oxidizing agent (air or oxygen). Three products result: gas, tar and charcoal. Biomass pyrolysis at different temperatures and residence periods was study in this paper using HTAG grid (High Temperature Air/Steam Gasification). Experiments were performed to investigate both the temperature effect on the wood devolatilisation and residence time effect on the pellet heating stage. Pyrolysis was applied at temperatures in range of 600 to 1000°C.

NUCLEAR FORCES AND NUCLEAR ENERGY

Eugeniu POTOLEA, Mihai SĂNDULEAC

The paper deals with two fundamental research topics in the traditional and pragmatic physics theory. Traditional physics does not identify nuclear forces but calculates nuclear energy based on „mass defect" from the Einstein theory of relativity. Pragmatic physics calculates the nuclear forces as high order gravitational forces and identifies the nuclear forces as internal energy of the atomic nucleus.

INVESTIGATING THE WAYS TO REDUCE ENERGETIC CONSUMPTIONS AND ENVIRONMENT POLLUTION IN BUILDING MATERIALS INDUSTRY WITH A SIMULATION PROGRAM

Adriana PRIBEANU, Roxana PĂTRAŞCU

The objective of this work is to present a simulation program for the investigation of the ways to reduce energetic consumptions and environment pollution. The application is intended to assist the energetic and environment audit at industrial contour level. The approach has a high degree of generality and flexibility in that it enables the auditor to describe an industrial contour in terms of energetic consumers and to store the description for future use.

Keywords: simulation, industrial contour, energetic audit, balance sheet, impact on the environment, energetic efficiency

MATHEMATICAL MODELLING OF BIOLOGICAL TREATMENT PROCESS IN THE SEWERAGE SYSTEM

Gina GHITA

Many people consider that the sewerage system is just a simple transport system for wastewater. Some biological, chemical and physical processes take place in the urban sewerage system. These processes modify wastewater characteristics during its transportation towards the treatment plant.
This paper shows the results of multiphase fluid flow inside the sewerage system, in aerobic conditions developed by introducing air in the aqueous medium by means of pneumatic oxygenation equipment

Keywords: sewerage system, mathematical modelling, aerobic transformation

NEW STANDARD SOLUTIONS FOR DATA ACQUISITION IN INTELLIGENT PROTECTION SYSTEMS

George MATEI

Development of the communication systems and data acquisition represent an important step which allow the development of the adaptive protection equipment and of the intelligent control systems that are depended by the high communication speed and special accuracy in data sending. In the author opinion, represent a personal contribution the presenting the way, which the data communication and acquisition systems had evolutes and the prominence of interdependence between these equipment ant the substations protection and control systems. In the paper was presented the new protocols for data acquisition and communication, which are used in the electrical substations and the communication development tenors for electrical power field.