C o n t e n t s

POWER ENGINEERING

PERFORMANCE ANALYSIS OF AN ADAPTIVE SCHEDULER FOR IEEE 802.16 WIRELESS ACCESS SYSTEMS

Nicolae NECULA, Eugen BORCOCI

This paper describes the detailed performance analysis of an adaptive method for optimal timeslot allocation in IEEE 802.16 wideband radio access technology. This method emulates in real time the behavior of a Genetic Algorithm-based offline scheduling algorithm that is designed to handle optimally the tradeoff between the priority and fairness, when attempting to meet the Quality of Service requirements defined by the IEEE 802.16 standard for all service classes.

Key words: adaptive packet scheduling, genetic algorithms, Matlab simulation, QoS, IEEE 802.16.1

INTEROPERABILITY OF INTEGRATED SERVICES AND DIFFERENTIATED SERVICES ARCHITECTURES

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The current trends in the development of real-time Internet applications and the rapid growth of mobile systems, indicate that the future Internet architecture will have to support various applications with different Quality of Service (QoS) requirements, regardless of whether they are running on a fixed or mobile terminals. This document presents a general Integrated Services / Differentiated Services architecture design with specific requirements. Integrated Services (IntServ) and Differentiated Services (DiffServ) are two of the current approaches to provide Quality of Service (QoS) guarantees in the next generation Internet. Integrated Services provide resource assurance through resource reservation for individual applications flows, whereas Differentiated Services use a combination of edge policing, provisioning and traffic prioritization. Finally, we present a comparison between Int Serv and DiffServ related to the applications, the type of services, the admission control and policy control.

Keywords: Quality of service, differentiated services, integrated services

FAST METHODS FOR IDENTIFICATION OF VIBRATION DEFECTS

Dan ȘTEFANOIU, Janetta CULIȚĂ, Florin IONESCU

Fault diagnosis is a domain that has reached its maturity within the last decade. The success of monitoring aiming to detect flaws during the functioning of some system tremendously depends on the signals which are encoding the information about possible defects. Such a signal is, for example, the vibration produced by mechanical systems. Several techniques have been devised in order to detect defects starting from vibrations. The paper focuses only on fast and easy to implement such techniques, among of which the one based on spectral envelope analysis is of the greatest interest in industry.

COMPARATIVE STUDY OF A MILL MACHINE'S DYNAMICS

Florin STRATULAT

Machine tools are designed to reach a given performance level in term of precision and static and dynamic stiffness. In this article, we present methods of evaluating linear axis dynamics starting from the dimensioning stage (simple dynamic model) up to complex modelling taking in consideration the disturbance force (constant and variable cutting force) and the controller. Further considerations are connected with the nonlinearity of the ballscrew stiffness and its influence upon the system behaviour.

A COMPARISON BETWEEN WIRELESS LAN SECURITY PROTOCOLS

Nidal TURAB, Florica MOLDOVEANU

The paper presents an analysis of the WEP, WPA and IEEE 802.11i protocols, from the WLANs security requirements point of view. Then, they are compared by two criteria: the network security level that each one assures and their influence on the network performance.

Keywords: - IEEE 802.11i, WEP, WPA, TKIP, CCMP and WPS.

SIMULATION MODELS VALIDATION USING THE OSSIM TOOL

Elena ULEIA

The objective of this paper is to present two validation methods for simulation models developed using the OSSim (Open Source Simulator) tool. In order to address this matter, a simulation model of a queueing system has been used. Both validation methods make use of observer entities, which evaluate certain simulation system properties, check the correctness of the analyzed performance data, and report the results. The present methods are statically validating the simulation model. This proves the OSSim tool capability for validation purposes.

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

OPTIMIZATION STRATEGIES FOR MPLS TRAFFIC ENGINEERING

Răzvan RUGHINIŞ, Răzvan DEACONESCU

The paper analyzes optimization strategies for Multiprotocol Label Switching (MPLS) Traffic Engineering in three different areas: Quality of Service awareness, network awareness and the design of routing algorithms. Recent developments in MPLS technology are discussed while identifying the main balancing possibilities within and between the three areas.

Keywords: MPLS, Traffic Engineering, Quality of Service, network awareness, computational complexity, heuristic algorithms

A HYBRID APPROACH TO THE PROBLEMS OF TIME-STAMPING

Cristian MARINESCU, Nicolae ŢĂPUŞ

One of the important problems with today's security protocols is to establish the exact time of certain events. Many security services require this capacity, but all known time-stamping protocols and standards encounter problems in delivering reliable and secure time-stamps. If this is in fact true, what changes and new protocols are required to achieve secure and trustworthy time-stamping services? This state-of-the-art paper presents an overview of the current situation in time-stamping and tries to put the advantages and disadvantages of the different available time-stamping schemes in perspective. The paper also aims to propose a hybrid approach to overcome the current dead-end in achieving highly secure time-stamping schemes.

Keywords: digital signatures, PKI, security, time-stamping, TSA

A COMPARISON OF A THREE PHASE INDUCTION MOTOR FED BY TWO DIFFERENT VOLTAGE SOURCES BEHAVIOR

Aurel-Ionuț CHIRILĂ, Ioan-Dragoş DEACONU, Constantin GHIȚĂ, Valentin NĂVRĂPESCU, Gianfranco CHICCO

In general induction machines are designed for sinusoidal voltages supply. When the machine is fed by an inverter a series of issues that can damage the machine arise. Thus, it is important to know the phenomena that are taking place inside the machine. At present induction machines' manufacturers use the advantage of different modeling and simulation software environments in order to create virtual prototypes. The paper presents a comparison between the internal behavior of a three-phase induction motor fed by sinusoidal voltages and by a six-pulse voltage inverter respectively.

Keywords: three-phase induction motor, six-pulse inverter model, finite element method.

MODELLING AND SIMULATION CONCERNING THE PROCESS FROM THE AERATION TANKS WITH ACTIVATED SLUDGE

Mihaela ILIE

Mathematical models of the activated sludge which are known at present give a detailed description about the dynamics of biological treatment, but neglect the hydrodynamic factor influence although the medium in which these biochemical reactions take place is an aqueous medium. This paper presents modelling and simulation of the dynamic evolution related to mass transfer process and to oxygen dispersion from air to water in the presence of the demand due to organic matter damage from the wastewater, in biological processes from the aeration tanks with activated sludge belonging to wastewater treatment plants.

Keywords: modelling, dissolved oxygen, activated sludge, wastewater

THE REMEDIATION OF CONTAMINATED SEDIMENTS BY CHEMICAL OXIDATION

Irina OPREA, Adrian BADEA, Giuliano ZIGLIO, Marco RAGAZZI, Gianni ANDREOTTOLA, Elisa FERRARESE, Tiberiu APOSTOL

In our days the pollution of air, water and soil represents a serous problem for human society. The aim of this work is to present an evaluation of effectiveness of chemical oxidation for the remediation of PAHs from polluted sediments. Chemical oxidation is a technique that uses chemicals to mineralize organic contaminants by changing them to harmless substances. The use of the chemical oxidation processes has been investigated for the remediation of environmental matrices contaminated by polycyclic aromatic hydrocarbons (PAHs). Laboratory experiments were conducted to assess the effects of different oxidant agents: H_2O_2, Fenton's Reagent, $KMnO_4$, $Na_2S_2O_8$, and combinations between them.

Keywords: soil pollution, PAHs, chemical oxidation, batch.

METHODOLOGIE D'ANALYSE ENVIRONNEMENTALEDES SYSTEMES DE COGENERATION

Roxana PĂTRAŞCU

The article presents a way of analysis of environmental impact for several different cogeneration systems using like methodology Life Cycle Analysis.

On considère un modèle d'application de l'analyse environnementale de différentes filières de cogénération en appliquant la méthodologie l'Analyse de Cycle de Vie (ACV).

Mots clefs : cogénération, l'Analyse de Cycle de Vie (ACV), protection de l'environnement, rejets polluants.