SUCEAVA

THE "STEFAN CEL MARE" UNIVERSITY
THE FACULTY OF ELECTRICAL ENGINEERING

Proceedings of the 6th International Conference on

DEVELOPMENT AND APPLICATION SYSTEMS

23 - 25 May, 2002 Suceava, ROMANIA

IEEE Romanian Section

Copyright ©2002 by „MUŞATINII" Publishing House
Suceava, str. Tipografiei nr. 1, 5800

All rights reserved. No part of this book may be reproduced in any form or by any means, without permission in writing from the publisher.

ISBN **973 – 98670 – 9 - X**

Published by: Faculty of Electrical Engineering Suceava, Romania
Edited by: A. Graur, G. Mahalu, D. Milici, Gh. St. Pentiuc,
A. D. Potorac, C-tin Filote
Cover design by: Architect C. Rabiniuc, Eng. M. Buta

Steering Committee

Oleg BREKHOV
- Moscow Aviation Institute - RUSSIA
Luc De BACKER
- Katholieke Hogeschool Sint-Lieven Gent - BELGIUM
Daniel CURIAC
- "Politehnica" University of Timişoara - ROMANIA
Jean Michel DUTHILLEUL
- Ecole Universitaire d'Ingénieurs de Lille - FRANCE
Stefan HOLBAN
- "Politehnica" University of Timişoara - ROMANIA
Maria IOANNIDES
- National Technical University of Athens - GREECE
Ionel JIAN
- "Politehnica" University of Timişoara - ROMANIA
Eleftherios A. KAYAFAS
- National Technical University of Athens - GREECE
Vladimir KRAPIVIN
- Moscow Institute of Radioengineering and Electronics - RUSSIA
Vladimir MESYURA
- The State Technical University of Vinnitsa - UKRAINE
John MILNER
- City University London – GREAT BRITAIN
Carine NAESSENS
- Katholieke Hogeschool Sint-Lieven Gent - BELGIUM
Jose OLIVEIRA e SA
- Instituto Politecnico do Porto - PORTUGAL
Bogdan MOROŞAN
- Scantech Electronics Inc , Toronto - CANADA
Nicola PITRONE
- Universita degli Studi Catania - ITALIA
Radu Emil PRECUP
- "Politehnica" University of Timişoara - ROMANIA
Stefan PREITL
- "Politehnica" University of Timişoara - ROMANIA
Octavian PROSTEAN
- "Politehnica" University of Timişoara - ROMANIA
Jean Paul SIX
- Université des Sciences et Technologies de Lille - FRANCE
Fedor SOPRONIUC
- University of Cernăuţi - UKRAINE
Gavril TODEREAN
- Technical University of Cluj-Napoca
Petre TODOS
- Technical University of Chişinău - MOLDAVIA
Bernard TOURSEL
- Université des Sciences et Technologies de Lille - FRANCE
Viorel TRIFA
- Technical University of Cluj-Napoca
Rodger ZIEMER
- Colorado Spring University - USA

Organizing Committee

Nicolae Dumitru ALEXANDRU
- Technical University Iaşi
Constantin FILOTE
- "Ştefan cel Mare" University of Suceava
Adrian GRAUR
- "Ştefan cel Mare" University of Suceava
Ioan JURCĂ
- "Politehnica" University of Timişoara
Ioan Alfred LEŢIA
- Technical University of Cluj-Napoca
Leon MANDICI
- "Ştefan cel Mare" University of Suceava
Radu MUNTEANU
- Technical University of Cluj-Napoca
Ştefan Gh. PENTIUC
- "Ştefan cel Mare" University of Suceava
Mircea PETRESCU
- "Politehnica" University of Bucharest
Alin Dan POTORAC
- "Ştefan cel Mare" University of Suceava
Cornel TURCU
- "Ştefan cel Mare" University of Suceava
Alexandru VALACHI
- Technical University of Iaşi

CONTENTS

Section A
DIGITAL SYSTEMS IN PROCESS CONTROL

Realization of Control and Monitoring in Operation of Transformers in Electric Power Systems
Petro LEZHNUK, Kostyantyn KRAVTSOV, Oleksandr HONCHARUK 1

A VHDL Model of a Pipelined Multiplier Accumulator
Lucian STOICA 7

Robust Similar Distributed System for Control of Technological Processes in Real Time
Victor ABABII, Viorica SUDACEVSCHI 11

Contributions in the Domain of the Utilization of the Circuit ADE7756 in Conception of Numerical μSystems with Applications in Energetics
Sorin BĂLĂUȚĂ, Vasile GĂITAN 16

Embedded Techniques for Autonomous Robot Orientation
Mihai V. MICEA, Lucian MUNTEAN, Daniel BROSTEANU 22

Algorithms for Interpreted Hierarchical High Level Petri Nets
Marius BREZOVAN, Dumitru Dan BURDESCU 28

Stochastic Complexity and Multiple Model Approach to Finite Memory Adaptive Filtering
Victoria BOGHANASTJUK, Nicolai KOBILEATZKY, Alexei VASCAN, Alexandru LORCENCOV, Veaceslav RICU, Igor BUGAIAN 36

Optimal Synthesis of the Control for Mechatronic Systems
Fedir SOPRONIUK, Tetyana HAIDAICHUK 44

Investigation of Properties of Singular Perturbed Control Systems with Varying Structure
Yevgeny SOPRONIUK 46

Minimax Estimation Problems in L_2 Spaces
Mykola RUSNAK, Valeriy FRATAVCHAN 49

Criteria of Movement Stability for Linear Non-Stationary Systems with Ellipsoidal Restrictions on the Set of Initial Data Changing
Vasyl KUSHNIRCHUK, Yuriy STETCKO 51

The Evaluation of Stability Degree under the Influence of Parameters' Variation of Objects' Models with Inertia and Identical Elements
Ion FIODOROV 53

The Tuning of Regulators to the Fourth Order Advance Delay Models of Objects with Time Delay
Bartolomeu IZVOREANU, Eugen RATĂ, Veaceslav BALTEANCO, Mihail BOȚU 57

An Algebraic Tuning Method of Regulators in Multiple-Loop Feedback Control Systems
Bartolomeu IZVOREANU, Irina ȚURCANU, Veaceslav BALTEANCO, Sergiu NICA 61

PC Radio-Interfacing Board
George MAHALU, Călin CIUFUDEAN, Radu PENTIUC 65

Three Variable Control (TVC) Module for Hydraulic Systems Control
Dinu PATELLI 70

Velocity Signal Estimation from Displacement and Acceleration Signals
Dinu PATELLI 74

How to Continue System Operation in the Presence of Faults ?
Anne-Lise GEHIN, Marcel STAROSWIECKI 78

Wireless Sensors – An Overview
Vasile GAITAN, Cristina TURCU, Cornel TURCU 86

Some Development Aspects Concerning Wins
Vasile GAITAN, Cornel TURCU, Cristina TURCU 92

Section B
ELECTRICAL DRIVES CONTROL

Simulation of Higher Harmonics Spreading Process in Electrical Circuits Using Nodal Equations
Petro LEZHNUK, Yury LUKIANENKO, Leonid YARNYH, Volodymyr VYDMYSH 96

Current Followers and Their Applications
Doru E. TILIUTE 100

Development of a Simulation Model for the Dynamic Operation of Double Output Induction Generator in Autonomous Wind Systems
Maria G. IOANNIDES and John M. KATINIOTIS 104

Modeling and Simulation of Three-Phase Inverters with a New Synchronous Pulsewidth Modulation
Vasily ERMURATSKY, Valentin OLESCHUK, Nina OVCHARENKO, Alexander SIZOV, Evgeny YAROSHENKO 112

Mathematical Model of Switched Reluctance Motor Including Magnetical Nonlinearities
Viorel TRIFA, Ovidiu RĂBULEA 118

Using Labview Package to Control Variable Reluctance Stepping Motors
Viorel TRIFA, Ovidiu RĂBULEA, Liviu ZĂRNESCU 122

Line Harmonics Reduction in High-Power Systems
Irinel – Valentin PLETEA 125

Mathematical Analysis of Active Power Measurement Error under Harmonic Distortion Part I: Measurements: Concepts, Functions and Active Power Analysis
Jordan SHIKOSKI, Manuel HERNANDEZ, Vladimir KATIC, Ustijana RECKOSKA 132

Mathematical Analysis of Active Power Measurement Error under Harmonic Distortion Part II: Synchronous, Asynchronous and Quantization Error Analysis
Jordan SHIKOSKI, Manuel HERNANDEZ, Vladimir KATIC, Ustijana RECKOSKA 141

The Needs for Standards and Measurements in a Deregulated Power System and it's Economic Impact
Jordan SHIKOSKI, Vladimir KATIC, Ustijana RECKOSKA 149

Contributions sur la détermination de l'indice horaire d'un transformateur triphasé par la méthode du courant continu
Cristina PRODAN, Elena SAVU, Mihaela Brânduşa NEGRU, Dorel CERNOMAZU 158

Designing Device Drivers for Sequential Character Access Using the Real-Time Operating System OS9
Radu Daniel VATAVU, Iulian CORDUNEANU 164

Device Driver & Application for Controlling Step Motors Using the Real-Time Operating System OS9
Radu Daniel VATAVU, Cornel TURCU, Vasile GAITAN 168

Practical Aspects of Using Three-Phase PWM CS Rectifiers
Stevan GRABIC, Vladimir KATIC 172

Magnetic Field Spectrum Determination Using Thermal Approach
Daniela MINESCU 176

Resonant Behaviour of Static VAR Compensators at Network Frequency Variation
A. M. MIRI, C. SIHLER 180

Section C
DATA TRANSMISSION AND PROTOCOLS

Error – Burst Correction Using Multiple Turbo – Codes
Luminița SCRIPCARIU 186

Bit Error Probability for Hamming Turbocodes in a Parallel Concatenation Scheme
Mihai VITANESCU 190

A New Runlenght Limited 2/3,(1,1,4,3) Code for Binary Asymmetric Channels
Felix DIACONU 196

Design of Band-Pass Active Filter in CMOS Technology Using the Low–Pass Prototype
Radu Gabriel BOZOMITU, Vlad CEHAN, Liviu GORAS 200

A Complete Spectral Characterization of Some HDBn Codes
Nicolae Dumitru ALEXANDRU 206

Spectral Shaping with T-Type Flip Flops
Nicolae Dumitru ALEXANDRU, Dimitris VOUKALIS, Vlad CEHAN,
Luminița SCRIPCARIU 213

A Stereo Multibit -Audio Digital-To-Analog-Converter
Irinel - Valentin PLETEA, Dan CEPAREANU 219

GPS Real-Time Car Navigation System
Gavril TODEREAN, Ioan TOMA, Gabriela CHIRA, Radu VESCAN, Cristian JURCA,
Alin INCLEZAN, Lucia LOCURATOLO, Antonio SERRA, Marco CONTENTI 225

On Receiver Collision Expansion Analysis in WDM Networks
Ioannis E. POUNTOURAKIS 229

Blocking Probabilities in WDM Networks
Ioannis E. POUNTOURAKIS 232

Section D
COMPUTER AIDED DESIGN

Computer Monitoring System for Electric Energy Consumption
Marius MARCU, Florin STOICA 239

VPNP – Software Tool for Modeling and Performance Evaluation Using Generalized Stochastic Petri Nets
Emilian GUȚULEAC, Constantin BOȘNEAGA, Andrei REILEAN 243

An Internet-Based Indoor Air Quality Measurement System
Dorel PICOVICI, D. LEVY, A.E. MAHDI, T. COFFEY 249

Modeling of Influence of Interferences on Parameters of Auto-Oscillations and Stability of Non-Linear Non-Stationary Systems
Sergey YUKHIMCHUK, Marat KHAZIN 255

Modeling of the One-Sector Rising Economy with Deflection Argument
Myroslav BOICHUK, Natalia SHMURIGINA 261

Intelligent Techniques Applications in Ecology for Soil Monitoring Systems by Internet
Costica NITU 268

Remote Measurement Methods Application in Ecology
Costica NITU, Vladimir KRAPIVIN, Ferdinand MKRTCHAN, Mikhail MIKHALEV 271

Features and Opportunities of Command - Information LAN
Oleg NICOLAICIUC,Emilian GUTULEAC,Vasile GÎSCĂ, Sergiu ZAPOROJAN 275

Hybrid Stochastic Petri Nets for the Discrete-Continuous Modeling and Performance Evaluation of Computer Systems
Emilian GUȚULEAC, Vasile GÎSCA, Sergiu ZAPOROJAN, Nicolae OBJELEAN 279

Computer Simulation of Oxygen Distribution in Tumours and Normal Tissues
Iuliana DAȘU 287

Conception d'un modele Bond Graph du processus de pervaporation
Abdelaziz NAKRACHI, Belkacem OULD BOUAMAMA 291

Section E
INFORMATION TECHNOLOGIES

Efficient Routing Using an Optimal Path Election Parallel Algorithm
Mitică CRAUS, Mihai Horia ZAHARIA, Cristian AMARANDEI 297

VRML Representations of Lindenmayer Systems
Sabin-Corneliu BURAGA, Diana STEFANESCU, Emilia PECHEANU 301

Performance Analysis of Checkpointing Schemes in a Multiprocessors Environment
Oleg BREKHOV, Saul de la ROSA NIEVES 307

Adaptive Scheduling of Tasks in the Conditions of System Overload
Oleg BREKHOV, Dmitry BABAK 314

Comparing C# and Java Features
Octavian PATRASCOIU 321

Implementing PKI Standards: A Case Study for Real-Time Revocation Checking Mechanisms
Marius MARIAN, Gheorghe MARIAN 329

Knowledge Management and E-Learning
Ileana HAMBURG, Daniel HAMBURG 338

Bottlenecks in Production Lines as Discrete Event Systems
Călin CIUFUDEAN, Gabriel ANASTASIU 344

Design and Implementation of a Business Process Representation Module
Costin BADICA, Chris FOX 349

Effective Algorithms of Rendering Procedure Parallelization for Forming Realistic Images
Alexandr ROMANYUK , Anatolii CHORNIJ 357

Problems of Associative Memory Design for Neural Network of Robot Trajectory Planning
Mykola F. KIRICHENKO, Yuriy V. KRAK, Olexandr V. BARMAK 362

Performability of Cellular Manufacturing Systems
Călin CIUFUDEAN, George MAHALU, Radu PENTIUC 368

An Experimental Set-Up for Smart Educational Laboratory
Nicola PITRONE 373

The Model of Informational Web Site
Vladimir MESYURA, Andrey ZAVARZIN 376

Visual C++ and MS Access 2000 Application for Interfacing a DTMF Hardware Module
Cristina TURCU, Cornel TURCU, Adrian GRAUR, Alin POTORAC 380

Negotiation Methods for Manufacturing Scheduling and Control with Multi-Agent Systems
Loredana NITU 384

A Distributed Reasoning System for Parallel and Distributed Knowledge-Based Systems
Corneliu NITU 391

Information Theory Aspects in Relational Database Design
Mircea PETRESCU 395

Section F
PATTERN RECOGNITION

Perceptron-Type Interpolation Systems of Artificial Intelligence
Oana GEMAN, Irinel - Valentin PLETEA 399

The Genetic Algorithm Based Defect Identification
Oana GEMAN, Irinel - Valentin PLETEA 405

Using Fuzzy Methods and Data Mining for Improving Manufacturing Processes
Ileana HAMBURG, Marion HERSH 412

Analysis of Statistical and Frequent Parameters for Letters Recognition.
Valeriy FRATAVCHAN, Mykola RUSNAK 417

Estimation of Dynamic Range of Oceanic Lidar Photodetector for Recognition System
P.A. MOLCHANOV, V.M. CONTARINO, A.I. LUCHENKO, V.O. CHEKOTUN 420

A Low Cost System for Image Classification
Nicola PITRONE 423

Supervising Bipolar Disorder Onset Utilizing Iris Scans Integrated within Controlled Access Security Systems
Iulian CORDUNEANU, Adrian GRAUR, Karen Kay Francis SHARP 426

The Analysis and Working Out of Coordinated Balance's Algorithms of Complex Values
Olexander ROIK, Natalia MESYURA 432

Technical Issues for Collaborative Geometric Modeling
Laurent GRISONI, Samuel DEGRANDE, Christophe CHAILLOU 437

13, University Street, 5800 Suceava, ROMANIA
http://www.eed.usv.ro