



EUROPEAN COMPUTING CONFERENCE

**Proceedings of the 4th EUROPEAN COMPUTING CONFERENCE
(ECC '10)**

**Universitatea Politehnica
Bucharest, Romania, April 20-22, 2010**

**SPONSOR and ORGANIZER:
Facultatea IMST, Universitatea Politehnica, Bucharest, Romania**

Electrical and Computer Engineering Series
A Series of Reference Books and Textbooks

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Preface

This year the 4th EUROPEAN COMPUTING CONFERENCE (ECC '10) was held at Universitatea Politehnica, Bucharest, Romania, April 20-22, 2010. The conference remains faithful to its original idea of providing a platform to discuss software engineering, hardware engineering, artificial intelligence, cryptology, computer vision, remote sensing, robotics, fuzzy logic, graph theory, supercomputing, computers in education etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Computer-Aided Process Planning and Scheduling Software for Make-to-Order Manufacturing of Machined Parts



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Abstract: Process planning is a key function of manufacturing companies that is responsible for the determination of methods by which a product is to be manufactured economically and competitively. To efficiently perform this function, computer-aided process planning (CAPP) systems are widely used. On the other hand, scheduling is another important function of manufacturing companies that gives the time each manufacturing operation should start and finish on assigned machine for the due dates of manufactured products to be efficiently met. Many computer-aided scheduling (CAS) systems are being used for the optimization of scheduling function. Unfortunately, because a poor collaboration or integration of CAPP and CAS systems, scheduling problems may occur in overloaded shops or high production costs may be obtained even for optimized process plans. The CAPP-CAS software that will be discussed during the lecture is a solution to overcome process planning and scheduling collaboration problems at make-to-order manufacturing of machined parts. There will be described the working sessions with the software, in terms of inputted data and outputted results. Some concluding remarks will be made on the quality of planning and scheduling solutions delivered by the software and on its future development.

Brief Biography of the Speaker:

Madalin Catana graduated in 1991 the Faculty of Machine Manufacturing Technology from Polytechnic Institute of Bucharest, Romania. He received his Ph.D. degree in Industrial Engineering from University POLITEHNICA of Bucharest, Romania, in 2002, with a thesis on computer-aided process structure planning and scheduling of machining and assembly processes in machine manufacturing industry. Since 1998 he is a lecturer in the department of Machine Manufacturing Technology, Faculty of Engineering and Management of Technological Systems, University POLITEHNICA of Bucharest.

His current research interests include manufacturing technologies, production management, modeling and simulation of manufacturing processes and systems, and CAD/CAPP/CAM technologies. He has co-authored more than 40 papers published in Romanian technical journals and proceedings of national and international conferences, and 10 academic books and laboratory guides on production engineering and management, assembly and machining technologies, and computer numerical control programming. He performed researches within 6 national research projects.

At present, he is a member of Academic Association of Manufacturing Engineering, Romania, and of Romanian Association for Economic Engineering.

Plenary Lecture 2

Statecharts Disentangled



Professor Albert Hoogewijs

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Abstract: We present the main results of the research obtained by Benjamin De Leeuw in his PhD thesis: Statechart DNA: Formal and Psychological Investigation into a Machine Theory. We derive the simplified statechart (language) by excluding all redundant constructs of the UML (Unified Modeling Language) metamodel on statecharts. Simplified state machines and their memory model are the central abstraction used throughout this work. Any UML state machine or procedural program transforms to exactly one simplified state machine. We derive the language grammar for simplified state machines by composing a scripting language that further abstracts any useful state machine. Each grammar rule gets a visual counterpart within the state machine diagram and we show how all useful state machines can be grown from these scripts. The parse tree of this grammar can be normalized such that any state machine has exactly one script, called statechart dna.

The first practical application is the generation of state machine test cases for tools having them as their domain of discourse. The second application of the theory is model checking state machine behavior without assuming interleaved action execution. We show how the less strenuous location consistency ordering, can be used to calculate more realistic views on memory state values. We introduce a weighted and recursively calculated numerical value to each grammar rule application and from it derive a useful and measurable state machine complexity metric. Another important application is the detection of changes in state machine specifications. Text versioning systems use the ability to reconstruct any previously checked-in version from keeping track of so-called delta sets or change sets. In case of structured text like procedural program code it is even possible to automatically merge these text documents. Within the above theoretical framework we derive a technique to calculate delta sets on state machines and on how to handle merges consistently.

Brief Biography of the Speaker:

Albert Hoogewijs obtained his PhD in mathematics from the University of Ghent in 1974. He studied logic at the University of Utrecht with Dirk van Dalen. He worked on three-valued logic for software specification, and was visiting professor at several European Universities, in the context of the Galois Network, an Erasmus project in mathematics and computer science. He is full professor at the Department of Pure Mathematics and Computer Algebra of the University of Ghent. He supervised several PhD theses and wrote a lot of articles in the area of automated theorem proving and software specification.

Plenary Lecture 3

AI Tools for Speech Analysis



Professor Horia-Nicolai Teodorescu

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Abstract: Speech involves huge amounts of information that only recently and still partly can be analyzed with a level of sophistication comparable to the human brain. For most languages, few progresses have been done in their detailed analysis using automatic means and many linguists and phoneticians still rely on their hearing in speech evaluation. An interdisciplinary group from four institutions in Iasi, Romania, has united their efforts during more than a decade for the advancement of tools for the understanding of spoken language processes like prosody, emotional speech and personal characteristics of the voice. A consistent repository for the Romanian language, with a vast section on emotional speech was created and is available on the web. Problems overviewed in this plenary talk are the analysis and description and recognition of emotions in voice, the comparison of emotional speech characteristics in different European languages, interaction of grammar and speech in specific grammatical constructions, spoken language statistics of the Romanian language, and pathologies' effects on speech. We overview the principles of the computational tools developed and the results of speech analysis, with an emphasis on spoken language statistics and emotional analysis and recognition in speech. The tools presented include GRID applications for statistical analysis of voice, serial programs for automatic speech pattern identification with biometric and data mining applications, programs for precise determination of the prosodic traits like voice pitch, and programs for statistical characterization of emotional speech.

Brief Biography of the Speaker:

Prof. dr.dr.h.c. Horia-Nicolai L. TEODORESCU is a correspondent member of the Romanian Academy (since 1994) in the Science and Information Technology Section and IEEE Senior member. He is a professor at the Faculty of Electronics, Telecommunications and Information Technology, Dept. Applied Electronics and Intelligent Systems, The "Gheorghe Asachi" Technical University of Iasi. He is a Vice-Rector for International Relations and Academic Image. Also, he is the Director of the Institute of Computer Science, Romanian Academy.

He authored, co-authored, or co-edited more than 25 books and about 300 papers and holds 24 national and international patents (numerous gold, silver and bronze medals at invention fairs in Brussels, Geneva, Tunis etc.)

He acts as Vice-president of the Commission for the Informatisation of the Romanian Language, Chairman of the Commission for Fuzzy Systems and IA -Romanian Academy, Iasi Branch (since 2004), is a member of the Panel Information Technology, SPS-NATO (2008-2011). Prof. Teodorescu is Founding editor for many scientific reviews, member or former member of editorial committees for numerous journals from Romania or from abroad (former Associate Editor, IEEE Trans. Men, Systems, Cybernetics C; Fuzzy Sets and Systems; J. General Systems). He was the initiator and a promoter for many national and international scientific societies (SIGEF, AEDEM, the Romanian Society for Fuzzy Systems and the Balkan Union for Fuzzy Systems and Artificial Intelligence – BUFSFA).

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