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Past President of the Intern. Geothermal Association, Oregon Institute of Technology, USA

RECENT ADVANCES in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

Proceedings of the 8th WSEAS International Conference on
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Preface

This year the 8th WSEAS International Conference on SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS (SEPADS '09) was held in the University of Cambridge. The Conference remains faithful to its original idea of providing a platform to discuss theoretical and applicative aspects of component technologies, design recovery and documentation, software design, consistency management and quality assurance, design, analysis, and implementation of multiple-processor systems, parallel languages and compilers, parallel/distributed algorithms 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.

During this last year we witnessed the growth of the European Union interest in Software Engineering. This is an additional proof that it is seen not only as an exciting research area but also as technologies that may solve current European citizens' concerns with several practical problems.

For a discipline which is central to research and also to industry, and which generates interests not only among academicians but also among large companies and government departments and agencies, it is important to look at the market and at its movements.

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

Software Risk Management through a Shared Approach

Professor Khairuddin Hashim
Software Engineering Department
Tenaga Nasional University
MALAYSIA
Email: khairuddin@uniten.edu.my

Abstract: Data on past and current problems in software development and their solutions are scarce. Software development problems cover a wide spectrum including aspects of processes and resources. Organizations do not want to reveal the software development problems they face and their outcomes due to obvious ramifications. Problems recur and solutions are many and varied. Mistakes are repeated due to unavailability of documentation on effective practices and measures. Not much is shared although the benefit of sharing is known. This presentation will discuss a risk management model with a unique shared approach towards effective sharing of problems and solutions by organizations without compromising on anonymity. Analysis of historical data provides useful information on potential problems and facilitates effective risk management of the software development process.

Brief Biography of the Speaker: Prof. Dr. Khairuddin graduated with a Ph.D. in computing science from the University of Bath, United Kingdom, in 1989. He has research interest, publications and international conference presentations on requirements engineering, software reuse, software risk management, software project management, human computer interaction and adaptive learning.
Dr. Khairuddin has over 20 years experience in academia spread over three academic institutions - University of Malaya, Tun Abdul Razak University and Tenaga Nasional University. He was a visiting professor at McGill University in 1995 and a research scholar at Kyoto University in 1993. Dr. Khairuddin was a consultant for SIDA (Swedish International Development Agency) in 2003. He was also a member of several international conference paper committees. He held top level administrative university posts such as Deputy President (Academic), Vice President (Technology) and Dean of Faculty. He has presented as keynote and plenary speaker at international and local conferences.
Apart from university related work, Prof. Dr. Khairuddin is/was also involved in being: panel member of Open System Expert Group for the Public Sector, Chief Editor of the Malaysian Journal of Computer Science, Software Engineering Consultant to Malaysian Institute of Microelectronic Systems (MIMOS), panel assessor for DAGS (Demonstrator Application Grant Scheme) for NITC, panel assessor for the Industry Research and Development Grant Scheme (IGS), member of Expert Group Service Sector (Information Technology) for IRPA (Intensified Research in Priority Areas), MSC Research & Development Grant Scheme Technology Assessment Consultant, Science Fund ICT Assessor and TechnoFund ICT Cluster Technology Assessment Consultant.

Plenary Lecture 2

Measuring Software Product Quality with ISO Standards: An Information Model

Professor Rafa E. Al-Qutaish
Department of Software Engineering
Al-Zaytoonah University of Jordan
Amman, Jordan
E-Mail: rafa@ieee.org

Abstract: The ISO is developing a new ISO 25000 series on Software Product Quality Requirements and Evaluation (SQuaRE) to improve the interpretation and use of quality measures for software products. This chapter explains how the ISO 19539 Measurement Information Model can be used to implement the ISO 9126 models for software product quality. It also identifies some of the harmonization issues arising as a result of the addition of new documents like ISO 25020 and ISO 25021, in particular with respect to previously published measurement standards for software engineering.

Brief Biography of the Speaker: Dr. Rafa E. Al-Qutaish received the B.Sc. degree in Computer Science from Yarmouk University, Jordan in 1993, the M.Sc. degree in Software Engineering from University of Putra, Malaysia in 1998, and Ph.D. degree in Software Engineering from the School of Higher Technology, University of Quebec, Canada in 2007. Currently, he is an assistant professor of Software Engineering in the Software Engineering Department, Al-Zaytoonah University of Jordan, Amman, Jordan.
Dr. Al-Qutaish works mainly in the area of Software Engineering. He also has the interest in some areas such as, Computer Networks and Artificial Intelligence. He wrote and published more than 20 scientific papers. He is a senior member of IEEE-CS and acting member of ACM.

Plenary Lecture 3

The Efficiency of Parallel Metaheuristics for Combinatorial Optimization – Paradigms, Models and Implementations

Professor Plamenka Borovska
Head of Computer Systems Department
Technical University of Sofia
BULGARIA
Email: pborovska@tu-sofia.bg

Abstract: Parallel metaheuristics have proved to provide efficient and powerful tools for combinatorial optimization of grand challenge scientific and engineering problems. Metaheuristics offer the opportunity to find out optimal or suboptimal solution of NP-hard problems in reasonable time. Combinatorial optimization based on metaheuristics implies tree major aspects – the search space, the neighborhood relations and the guiding function, the specific forms of which determine the metaphor of the computation. The search strategies for the optimum implied may be trajectory-based or population-based, the latter simulating biological or cultural evolution. The major goal of parallelizing metaheuristics is not only to reduce significantly the computational time but to improve the quality of solutions obtained as well. The motives to utilize parallel metaheuristics are diversification and intensification. The paper focuses on the specifics of designing parallel computational models based on metaheuristics, implementing various parallel algorithmic paradigms and optimizing the correlations architectural space – target parallel computer architecture. Classifications of parallel computational models in respect to the granularity are presented. The aspects of tuning algorithmic parameters to the specifics of the problem being solved are considered. The problems of building up metaheuristics class libraries are under consideration. Parallel performance evaluation and quality of solution estimation on the basis of parallel program implementations are treated. Case studies are presented for trajectory-based and population-based parallel metaheuristics implementations on compact computer cluster of multi-core servers (super-server).

Brief Biography of the Speaker: Prof. PhD Plamenka Borovska graduated from the Technical University of Sofia, Bulgaria, specialty Computer Systems and Technologies. Her PhD thesis is in the area of parallel computing. She defended her habilitation thesis “Strategies, Methods and Models for Parallel Information Processing” in 2007 at the Technical University of Sofia. Her research areas comprise parallel computing, high performance computer architectures, parallel algorithms and parallel programming, GRID technologies, parallel metaheuristics, bioinformatics, virtual screening and computer simulations for drug design. She has specialized in UK, University of Manchester, Computer Science Dept., Italy, Polytechnics of Milan, Dept. of Electronics and Information, Germany, University of Karlsruhe, Institute of Informatics. Prof. Borovska has about 100 publications at scientific journals and international conferences, has been a project manager of about 20 research projects focused on parallel computing, and has patents in USA and UK for multiprocessor systems.
Presently, Prof. Borovska is head of the Computer Systems Dept., Technical University of Sofia (URL: http://csconf.org/cs/leader_eng.htm). She is the Bulgarian representative in the International Federation of Information Processing IFIP in Technical committee 10, a member of IEEE, ACM Computer Society, a member of the Specialized Scientific Council in electronics and computing of the High Attestation Commission in Bulgaria, expert in information technologies for the State Agency for Information Technologies and Communication, Bulgaria and for the National Innovation Funds, editor-in-chief of the scientific journal “Computer Engineering”, Bulgaria. In 2006 she was awarded by the Bulgarian Academic Society for Computer Systems and Information Technologies for significant contribution to the development of information technologies in Bulgaria.

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