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New Trends in Software Methodologies, Tools and Techniques

Proceedings of the Thirteenth SoMeT_14

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Preface

Software is the essential enabler for science and the new economy. It creates new markets and new directions for a more reliable, flexible and robust society. It empowers the exploration of our world in ever more depth. However, software often falls short of our expectations. Current software methodologies, tools, and techniques remain expensive and are not yet sufficiently reliable for a constantly changing and evolving market, and many promising approaches have proved to be no more than case-by-case oriented methods.

This book explores new trends and theories which illuminate the direction of developments in this field, developments which we believe will lead to a transformation of the role of software and science integration in tomorrow's global information society. By discussing issues ranging from research practices and techniques and methodologies, to proposing and reporting solutions needed for global world business, it offers an opportunity for the software science community to think about where we are today and where we are going.

The book aims to capture the essence of a new state of the art in software science and its supporting technology, and to identify the challenges that such a technology will have to master. It contains extensively reviewed papers presented at the 13th International Conference on New Trends in Intelligent Software Methodology Tools, and Techniques, (SoMeT_14) held in Langkawi, Malaysia with the collaboration of Universiti Teknologi Malaysia, (Johor Baharu, Malaysia) from September 22–24, 2014. (http://seminar.spaceutm.edu.my/somet2014/). This round of SoMeT_14 is celebrating the 13th anniversary.[1] SoMeT conference series is ranked as B+ rank among other high ranking Computer Science conferences worldwide.

This conference brought together researchers and practitioners to share their original research results and practical development experience in software science and related new technologies.

This volume participates in the conference and the SoMeT series[1] of which it forms a part, by providing an opportunity for exchanging ideas and experiences in the field of software technology; opening up new avenues for software development, methodologies, tools, and techniques, especially with regard to intelligent software by

[1] Previous related events that contributed to this publication are: SoMeT_02 (the Sorbonne, Paris, 2002); SoMeT_03 (Stockholm, Sweden, 2003); SoMeT_04 (Leipzig, Germany, 2004); SoMeT_05 (Tokyo, Japan, 2005); SoMeT_06 (Quebec, Canada, 2006); SoMeT_07 (Rome, Italy, 2007); SoMeT_08 (Sharjah, UAE, 2008); SoMeT_09 (Prague, Czech Republic, 2009); SoMeT_10 (Yokohama, Japan, 2010), and SoMeT_11 (Saint Petersburg, Russia), SoMeT_12 (Genoa, Italy), SoMeT_13 (Budapest, Hungary).

applying artificial intelligence techniques in Software Development, and tackling human interaction in the development process for better high level interface. The emphasis has been placed on human-centric software methodologies, end-user development techniques, and emotional reasoning, for an optimally harmonised performance between the design tool and the user.

The word “intelligent” on the SOMET emphasises the need for applying artificial intelligence issues of software design for systems application for example in disaster recovery and other system supporting civil protection and other inquire human intelligence as requirement in system engineering.

A major goal of this work was to assemble the work of scholars from the international research community to discuss and share research experiences of new software methodologies and techniques. One of the important issues addressed is the handling of cognitive issues in software development to adapt it to the user’s mental state. Tools and techniques related to this aspect form part of the contribution to this book. Another subject raised at the conference was intelligent software design in software ontology and conceptual software design in practice human centric information system application. The book also investigates other comparable theories and practices in software science, including emerging technologies, from their computational foundations in terms of models, methodologies, and tools. This is essential for a comprehensive overview of information systems and research projects, and to assess their practical impact on real-world software problems. This represents another milestone in mastering the new challenges of software and its promising technology, addressed by the SoMeT conferences, and provides the reader with new insights, inspiration and concrete material to further the study of this new technology.

The book is a collection of carefully selected refereed papers by the reviewing committee and covering:

- Software engineering aspects of software security programmes, diagnosis and maintenance
- Static and dynamic analysis of software performance models
- Software security aspects and networking
- Agile software and lean methods
- Practical artefacts of software security, software validation and diagnosis
- Software optimization and formal methods
- Requirement engineering and requirement elicitation
- Software methodologies and related techniques
- Automatic software generation, re-coding and legacy systems
- Software quality and process assessment
- Intelligent software systems design and evolution
- Artificial Intelligence Techniques on Software Engineering, and Requirement Engineering
- End-user requirement engineering, programming environment for Web applications
- Ontology, cognitive models and philosophical aspects on software design,
- Business oriented software application models,
- Emergency Management Informatics, software methods and application for supporting Civil Protection, First Response and Disaster Recovery

- Model Driven Development (DVD), code centric to model centric software engineering
- Cognitive Software and human behavioural analysis in software design.

All 79 papers selected among 192 submissions published in this book have been carefully reviewed, on the basis of technical soundness, relevance, originality, significance, and clarity, by up to four reviewers. They were then revised on the basis of the review reports before being selected by the SoMeT_14 international reviewing committee.

This book is the result of a collective effort from many industrial partners and colleagues throughout the world. In special we would like acknowledge our gratitude to Universiti Teknologi Malaysia especially the Vice Chancellor; Dr. Wahid Omar, Iwate Prefectural University, SANGIKYO Co. Japan, and all the others who have contributed their invaluable support to this work. Most especially, we thank the reviewing committee and all those who participated in the rigorous reviewing process and the lively discussion and evaluation meetings which led to the selected papers which appear in this book. Last and not least, we would also like to thank the Microsoft Conference Management Tool team for their expert guidance on the use of the Microsoft CMT System as a conference-support tool during all the phases of SoMeT_14.

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Contents

Preface v

Scientific Program Committee and Reviewers ix

Chapter 1. Artificial Intelligence Techniques on Software Engineering, and Requirement Engineering

Automatic Music Emotion Classification Using Artificial Neural Network Based on Vocal and Instrumental Sound Timbres 3
Mudiana Binti Mokhsin, Nurlaila Binti Rosli, Wan Adilah Wan Adnan and Norehan Abdul Manaf

User's Satisfaction in Recommendation Systems 15
Shahid Kamal, Roliana Ibrahim and Imran Ghani

Rice-Planted Area Extraction by RADARSAT Data by Competitive Neural Networks 26
Sigeru Omatu and Mitsuaki Yano

Intelligent Synchronization Tool Using ANFIS for Multi Robot Manipulators 37
Parvaneh Esmaili and Habibollah Haron

Gradient Histogram Feature Based Ear Recognition Using Neural Network Classifier 51
Ugbaga Nkole Ifeanyi, Ghazali Sulong and Shamsuddeen Sani Muhammed

Hybridization of Hidden Markov Model and Case Based Reasoning for Time Series Forecasting 63
Azuanda Azlina Zahari and Jafrezal Jaafar

The Interaction of Subsystems Operating in a Container Terminal: Modeling Peculiarities and Simulation Solutions for the Logistics Chain Optimization 75
Guseppe Converso, Mosè Gallo and Teresa Murino

An Improved Intrusion Detection Approach Using Synthetic Minority Over-Sampling Technique and Deep Belief Network 94
S. Hasan Adil, S. Saad Azhar Ali, Kamran Raza and A. Mahmood Hussaan

Feasibility of Text Visualization in Text Steganalysis 103
Rose Hafsah Ab. Rauf and Nurhafizah Jamal

Hybrid Genetic Algorithm of Interferometric Synthetic Aperture Radar for Three-Dimensional Coastal Deformation 116
Maged Marghany

A Probabilistic Logic to Reason About the Interaction Between Knowledge and Social Commitments in MASs 132
Khalid Sultan, Jamal Bentahar and Omar Marey

An Evolutionary Algorithm for Simultaneous Localization and Mapping (SLAM) with a New Fitness Function 148
Mohsen Mahrami, Habibollah Haron and Ali Asadi

Synchronous Gravitational Search Algorithm vs Asynchronous Gravitational Search Algorithm: A Statistical Analysis 160
Nor Azlina Ab. Aziz, Zuwairie Ibrahim, Sophan Wahyudi Nawawi, Shahdan Sudin, Marizan Mubin and Kamarulzaman Ab. Aziz

Performance Evaluation of Vector Evaluated Gravitational Search Algorithm II 170
Badaruddin Muhammad, Zuwairie Ibrahim, Kamarul Hawari Ghazali, Mohd Riduwan Ghazali, Muhammad Salihin Saealal, Kian Sheng Lim, Sophan Wahyudi Nawawi, Nor Azlina Ab. Aziz, Marizan Mubin and Norrima Mokhtar

An Assembly Sequence Planning Approach with Binary Gravitational Search Algorithm 179
Ismail Ibrahim, Zuwairie Ibrahim, Hamzah Ahmad, Zulkifli Md. Yusof, Mohd Ibrahim Shapiai, Sophan Wahyudi Nawawi and Marizan Mubin

Improving Consistency in Fuzzy Preference Relations with an Allocation of Information Granularity 194
Francisco Javier Cabrerizo, Witold Pedrycz, Francisco Chiclana and Enrique Herrera-Viedma

A Framework for Improvement a Decision Tree Learning Algorithm Using K-NN 206
Masaki Kurematsu, Jun Hakura and Hamido Fujita

Subjective Decision Making for Task Worker Using Metaheuristics Technique 213
Kohei Sugawara and Hamido Fujita

Chapter 2. Requirement Engineering, Especially for High-Assurance System, and Requirement Elicitation

MEReq: A Tool to Capture and Validate Multi-Lingual Requirements 231
Massila Kamalrudin, Safiah Sidek, NoorrezamYusop, John Grundy and John Hosking

Automatic Acceptance Test Case Generation from Essential Use Cases 246
Massila Kamalrudin, M. Nor Aiza, John Grundy, John Hosking and Mark Robinson

Integration of Safety Risk Assessment Techniques into Requirement Elicitation 256
Eileen Yeow and Yin Kia Chiam

Classifying Software Requirements Using Kano's Model to Optimize Customer Satisfaction 271
Balsam A. Mustasfa

Requirements Elicitation Techniques Selection Survey 280
Fares Anwar and Rozilawati Razali

A Bi-Metric and Fuzzy c-Means Based Intelligent Stakeholder Quantification System for Value-Based Software 295
Muhammad Imran Babar, Masitah Ghazali and Dayang N.A. Jawawi

New Method for Generation of RFLP Structure Elements in PLM Model 310
László Horváth and Imre J. Rudas

Chapter 3. Intelligent Software Systems Design, and Software Evolution Techniques

Mobile Positioning Solution Suitable for Intelligent Transportation System Based on IEEE802.11a 327
Peter Brida and Juraj Machaj

Adapted Indoor Positioning Model Based on Dynamic WLAN Fingerprinting RadioMap 337
Iyad Halshami, Noor Azurati Ahmad and Shamsul Sahibuddin

Ontology COKB for Designing Knowledge-Based Systems 354
Nhon V. Do

Evaluation of Intelligent Mobile Web Pre-Fetching System for Mobile Cloud Environment 374
Nur Syahela Hussien, Sarina Sulaiman and Siti Mariyam Shamsuddin

Bellmark Identification Using SIFT Features 388
Yoshinaga Daiki, Kobayakawa Michihiro, Yokoi Takeru and Iwata Mitsuru

Content-Based Analysis Method for Sentiment Scoring in Microblogging Mining 398
Nurfadhlina Mohd Sharef and Fartash Haghanikhameneh

Chapter 4. Emergency Management Informatics, Software Methods and Application for Supporting Civil

Towards a Knowledge Management Framework for Disaster Management in Malaysia 417
Mohd Zuhaili Mohd Rodzi, Nor Hidayati Zakaria, Mohammad Nazir Ahmad and Hasniza Yahya

Automated WiFi-Based Localization and Visualization of Wireless Network 432
Pavel Kriz

Managing Information and Knowledge in Malaysia's Flood Management: Towards a New Framework 446
Mohammad Nazir Ahmad, Marini Othman, Nor Hidayati Zakaria and Mohd Zuhaili Mohd Rodzi

Application Engines in VMVC-Based Tsunami Modeling Environment 464
Kensaku Hayashi, Alexander Vazhenin and Andrey Marchuk

Requirements Engineering of Malaysia Radiation and Nuclear Emergency Plan Simulator 476
Amy Hamijah Ab. Hamid, Mohd Zaidi Abd Rozan, Roliana Ibrahim, Safaai Deris, Ali Selamat and Muhd. Noor Muhd Yunus

Chapter 5. Software Methodologies, and Tools for Robust, Reliable, Non-Fragile Software Design

Rapid Prototyping for Low-Level Hybridization of PSO-GA 495
S. Masrom, Siti Z.Z. Abidin, N. Omar and K. Nasir

From Computer Science to Software Engineering – A Programming-Level Perspective 513
Paul Bailes, Leighton Brough and Colin Kemp

Highlighting Value and Effort Drivers Early in Business and System Models 530
Matthias Book, Simon Grapenthin and Volker Gruhn

Methodologies for Agile Product Line Engineering: A Survey and Evaluation 545
Farima Farmahini Farahani and Raman Ramsin

Framework for Managing of Learning Resources for Specific Knowledge Areas 565
Aneta Bartuskova, Ondrej Krejcar, Ali Selamat and Kamil Kuca

Rubrics to Assess Usability of Embedded Systems 577
Masitah Ghazali, Muhammad Aminu Umar and Mahmood Ashraf

Chapter 6. Medical Informatics and Bioinformatics, Software Methods and Application for Biomedicine and Bioinformatics

Enhancing Model Classification Using Particle Initialized Based Noise Eliminating 593
Nur A. Sahadun, Habibollah Haron, Nor A. Ali and Mohammed R.A. Kadir

Spatial Features Terms for Describing Lung Nodule Location in Chest X-Ray Images 608
Mohd Nizam Saad, Zurina Muda, Noraidah Sahari Ashaari and Hamzaini Abdul Hamid

Epitope Prediction Based on Geometric Spiral Features of Neighboring Surface Residues 620
Ying-Tsang Lo, Hamido Fujita and Tun-Wen Pai

Minimal Training Time in Supervised Retinal Vessel Segmentation 631
Mohd Zulfaezal Che Azemin

Extracting Significant Features from Virtual Histology to Detect Vulnerable Plaque 639
Zahra Rezaei, Ali Selamat, Arash Taki, Mohd Shafry Mohd Rahim and Mohammed Rafiq Abdul Kadir

Supervised Pterygium Fibrovascular Redness Grading Using Generalized Regression Neural Network 650
Mohd Zulfaezal Che Azemin, Mohd Radzi Hilmi and Khairidzan Mohd Kamal

Chapter 7. Software Quality and Process Assessment for Business Enterprise Models

Applying Fuzzy-TOPSIS Algorithm in Prioritizing Software Requirements 659
Philip Achimugu, Ali Selamat and Roliana Ibrahim

AVTAC: A Framework for Automatic Auditing of Access Control in Windows and Linux Systems 672
Khadija Arrachid, Mohamed Mejri and Etienne Theodore Sadio

A Robust System Integration for Autonomous Evacuation Navigation 692
Khyrina Airin Fariza Abu Samah, Burairah Hussin and Abd Samad Hasan Basari

Systematic Mapping Study in Automatic Test Case Generation 703
Shayma Mustafa Mohi-Aldeen, Safaai Deris and Radziah Mohamad

A Process Model for Efficient Software Engineering Practice 721
Philip Achimugu, Ali Selamat and Roliana Ibrahim

SCLP Software for Thermal Process Control of Nanowire Fabrication and Multilayer Nanochip System 736
Norma Alias, Noriza Satam, Mohd Shahizan Othman, Che Rahim Che Teh, Maizatul Nadirah Mustaffa and Hafizah Farhah Saipan Saipol

Chapter 8. Creative and Arts in Software Design Principals

Towards Domain Ontology Interoperability Measurement 753
Hussein Sseggujja and Ali Selamat

Redefining Game Engine Architecture Through Concurrency 767
Ali Mohebali and Thiam Kian Chiew

Applying *AIDA Programs as Educational Materials 783
Yutaka Watanobe, Nikolay Mirenkov and Mirai Watanabe

A Matrix Approach in System Dynamics Simulations: The Case of Flow Shop Layout Architecture in PTO Production Environment 799
Monica Ascione, Piera Centobelli, Guseppe Converso and Liberatina C. Santillo

Simulated Annealing Based Strategy for Test Redundancy Reduction 818
Kamal Z. Zamli, Mohd Hafiz Mohd Hassin, Basem Al-Kazemi and Atif Naseer

A Bottom-up Approach for Visualisation System Development Using Game Engine 833
Farhan Mohamed, Phil W. Grant and Min Chen

An Intelligent Real-Time Application for Casting Shadows in Outdoor Environments 846
Hoshang Kolivand and Mohd Shahrizal Sunar

Chapter 9. Others Software Science Disciplines

Tools for Teaching and Learning Programming: A Review and Proposed Tool 859
Nurliana Yusri, Ain Zulika, Sharifah Mashita Syed-Mohamad and Nur'Aini Abdul Rashid

Nested Event Model 873
Nyuk Hiong Siaw, Narayanan Kulathuramaiyer, Bali Ranaivo-Malançon and Jane Labadin

Event Lexical Database: A Semantic Role Labeling Approach 884
Nyuk Hiong Siaw, Narayanan Kulathuramaiyer, Bali Ranaivo-Malançon and Jane Labadin

Literacy for Oncoming Centuries 899
Victor Malyshkin

Exploring the Research Methods Employed for Investigating Current Challenges in E-Learning Adoption in Universities: A Short Literature Review 906
Franklyn Chukwunonso, Roliana Ibrahim and Ali Selamat

Strategy to Activate Rural Areas Using Web Advertising and Social Networks 921
Issei Komatsu, Masanori Takagi, Keizo Yamada and Jun Sasaki

System Dynamics Analysis: Simulation Case Study on Production 936
Guido Guizzi, Daniela Miele, Daniela Chiocca, Liberatina Carmela Santillo and Elpidio Romano

Biogeography-Based Optimisation for Data Clustering 951
Abdelaziz I. Hammouri and Salwani Abdullah

Performance Comparison of Popular Routing Algorithms in Pocket Switched Networks 964
Deni Yulianti, Satria Mandala, Dewi Nasien, Md. Asri Ngadi and Coulibaly Yahaya

Automatic Classification of Cross-Document Structural Relations for Discussion Summarization 979
Ibrahim Almahy and Naomie Salim

Adaptive Learning for Lemmatization in Morphology Analysis 991
Mary Ting, Rabiah Abdul Kadir, Tengku Mohd Tengku Sembok, Fatimah Ahmad and Azreen Azman

Sentence-Based Plagiarism Detection Focusing on Nouns and Part-of-Speech Structure 1006
Takeru Yokoi, Gouki Oikawa, Mitsuru Iwata, Takashi Sato and Michihiro Kobayakawa

Interactive Characterization of a Code Pattern 1016
Ken Nakayama, Eko Sakai and Michihiro Kobayakawa

Chapter 10. Static, Dynamic Analysis on Software Performance Model, Software Maintenance

COCHCOMO: A Change Effort Estimation Tool for Software Development Phase 1029
Nazri Kama, Sufyan Basri, Mehran Halimi Asl and Roslina Ibrahim

A Knowledge-Based Decision Making Model to Support the Analysis Phase in Software Maintainance 1046
Rahma A. Kamaludeen, Yu.-N. Cheah and Shahida Sulaiman

Collecting Scholars' Background Knowledge for Profiling 1058
Bahram Amini, Roliana Ibrahim, Mohd Shahizan Othman and Mohammad Ali Nematbakhsh

Ontology for Autonomous Mobile Robot System 1073
Furkh Zeshan, Radziah Mohamad, Mohammad Nazir Ahmad and Syed Asad Hussain

Type-2 Fuzzy Logic Based Prediction of Object Oriented Software Maintainability 1086
S.O. Olatunji and Ali Selamat

Subject Index 1101

Author Index 1105