Session 1A: Formal Methods I

A Context-Based Integrity Framework ......................................................... 1

    Mark Anderson, Paul Montague, and Benjamin Long

Integration of Safety Verification with Conformance Testing in Real-Time
Reactive System ............................................................................................ 10

    Haiying Sun, Jing Liu, and Dehui Du

Modular Heap Abstraction-Based Memory Leak Detection
for Heap-Manipulating Programs .............................................................. 20

    Longming Dong, Ji Wang, and Liqian Chen

A CSP-theoretic Framework of Checking Conformance of Business Processes ......................................................... 30

    Suman Roy, Siddharth Bihary, and Jose Alfonso Corso Laos
Session 1B: Context-aware and Intelligent Systems

Applying Recommendation Systems for Composing Dynamic Services for Mobile Devices ................................................................. 40
Jari Pääkkö, Mikko Raatikainen, Varvara Myllärniemi, and Tomi Männistö

Towards an Adaptive Service Degradation Approach for Handling Server Overload ........................................................................ 52
Ziyou Wang, Minghui Zhou, and Hong Mei

Session 1C: Software Security, Reliability and Privacy

A Preference and Honesty Aware Trust Model for Web Services ........................................................................................................ 61
Rui Song, Bixin Li, Xiaona Wu, Cuicui Liu, and Shanshan Qi

Trust-Based Service Composition and Optimization ......................................................................................................................... 67
Xiaona Wu, Bixin Li, Rui Song, Cuicui Liu, and Shanshan Qi

A Trust Impact Analysis Model for Composite Service Evolution ..................................................................................................... 73
Shanshan Qi, Bixin Li, Cuicui Liu, Xiaona Wu, and Rui Song

Modeling and Verification of Context-Aware Systems ......................................................................................................................... 79
Minh H. Tran, Alan Colman, Jun Han, and Hongyu Zhang

The Case for Using Simulation to Validate Event-B Specifications .................................................................................................... 85
Faqing Yang, Jean-Pierre Jacquot, and Jeanine Souquierès

Semi-Automated Verification of Defense against SQL Injection in Web Applications ........................................................................ 91
Kaiping Liu, Hee Beng Kuan Tan, and Lwin Khin Shkar

Session 2A: Requirements Engineering I

Discovering Early Aspects through Goals Interactions ......................................................................................................................... 97
Jonathan Lee, Kuo-Hsun Hsu, Shin-Jie Lee, and Wen-Tin Lee

Automated Functional Scenarios-Based Formal Specification Animation .................................................................................................. 107
Mo Li and Shaoying Liu

DRE-specific Wikis for Distributed Requirements Engineering: A Review ............................................................................................. 116
Rong Peng and Han Lai

Service-Driven Migrating of Enterprise Information Systems: A Case Study ....................................................................................... 127
Ziyian Xu, Haibong Zhao, Sheau Ling Tan, and Lin Liu
Session 2B: Product-Line Software Engineering

Supporting Awareness during Collaborative and Distributed Configuration of Multi Product Lines .......................................................... 137

*Gerald Holl, Paul Grünbacher, Christoph Elsner, and Thomas Klambauer*

Leveraging CVL to Manage Variability in Software Process Lines ........................................................................................................ 148

*Emmanuelle Rouillé, Benoît Combemale, Olivier Barais, David Touzet, and Jean-Marc Jézéquel*

Relationships Formalization for Model-Based Product Lines .............................................................................................................. 158

*Stephen Creff, Joël Champeau, Arnaud Monégier, and Jean-Marc Jézéquel*

Session 2C: Software Verification and Validation

Debugging Model-to-Model Transformations .................................................. 164

*J. Schönböck, G. Kappel, M. Wimmer, A. Kusel, W. Retschitzegger, and W. Schwinger*

Model-Checking C Programs against JML-like Specification Language ........................................................................................................... 174

*Masahiro Sakai, Kohei Marucbi, and Takeo Imai*

Resynchronizing Model-Based Self-Adaptive Systems with Environments ................................................................................................................ 184

*Lingbao Zhang, Chang Xu, Xiaoxing Ma, Tianxiao Gu, Xuezbi Hong, Chun Cao, and Jian Lu*

Software-Based Online Monitoring of Cache Contents on Platforms without Coherence Fabric .................................................................................................................. 194

*Adriaan Schmidt and Oliver Horst*

Session 3A: Software Engineering Environments and Tools

An Experimentation Platform for the Automatic Parallelization of R Programs ........................................................................................................... 203

*Frank Padberg and Michael Mirolld*

Discovering Domain Concepts and Hyponymy Relations by Text Relevance Classifying Based Iterative Web Searching .................................................................................................................. 213

*Lili Mou, Ge Li, Zhi Jin, Yangyang Lu, and Yi Yang Hao*

Semi-static Detection of Runtime Type Errors in Component-Based Java Programs .............................................................................................................. 223

*Xiaowei Zhou, Wenbo Zhang, and Jianhua Zhang*

Protego: In-Memory Version Control System in the Cloud .................................................................................................................. 232

*Filippo Gioachin, Qianhui Liang, Yuxia Yao, and Bu-Sung Lee*
Session 3B: Software Maintenance and Evolution I

An Empirical Study on Improving Severity Prediction of Defect Reports Using Feature Selection
Cheng-Zen Yang, Chun-Chi Hou, Wei-Chen Kao, and Ing-Xiang Chen

Linking Functions and Quality Attributes for Software Evolution
Hongji Yang, Shang Zheng, William Cheng-Chung Chu, and Ching-Tsorng Tsai

Bug Prediction Metrics Based Decision Support for Preventive Software Maintenance
Girish Maskeri, Deepthi Karnam, Sree Aurovindh Viswanathan, and Srinivas Padmanabhan

Session 3C: Software Project Management and Applications

An Approach to Generate Actor-Oriented Activity Charts from Use Case Requirements
Saurabh Tiwari, Santosh Singh Rathore, Abhijeet Singh, Abhinav Singh, and Atul Gupta

Process Model of Software Method Transition
Natalja Nikitina and Mira Kajko-Mattsson

A Design Pattern to Build Executable DSMLs and Associated V&V Tools
Benoît Combemale, Xavier Crégut, and Marc Pantel

Evaluation Metric for Multiple-Bug Localization with Simple and Complex Predicates
Yiwei Zhang, Eric Lo, and Ben Kao

Dependency Based Approach for Software Analysis Web Services Replacement
Chaman Wijesiriwardana, Giacomo Ghezzi, Emanuel Giger, Atsushi Sawada, and Harald Gall

Testing of Component-Based Systems
Bilal Kanso, Marc Aiguier, Frédéric Boulanger, and Christophe Gaston

Session 4A: Code Analysis and Testing

Precise Analysis of Large Industry Code
Priyanka Darke, Mayur Khanzode, Arun Nair, Ulka Shrotri, and R. Venkatesh

Norihiro Yoshida, Yoshi Higo, Shinji Kusumoto, and Katsuro Inoue

Enhancing Symbolic Execution to Test the Compatibility of Re-engineered Industrial Software
Susumu Tokumoto, Tadahiro Uebara, Kazuki Munakata, Haruyuki Isbida, Toru Eguchi, and Masafumi Baba
Test Case Selection Based on Path Conditions of Symbolic Execution ............................................. 318
  Kazuki Munakata, Shoichiro Fujiwara, Susumu Tokumoto, and Tadahiro Uebara

Session 4B: Requirement Modelling and Analysis

The NORMAP Methodology: Lightweight Engineering of Non-functional
Requirements for Agile Processes ........................................................................................................ 322
  Weam M. Farid

Automated Analysis of Textual Use-Cases: Does NLP Components and Pipelines
Matter? ............................................................................................................................................ 326
  Naveen Kulkarni, Deepti Parachuri, Madhuri Dasa, and Abhishek Kumar

Empirical Analysis of the Impact of Requirements Traceability Quality to
the Productivity of Enterprise Applications Development .................................................................. 330
  Shinobu Saito, Takashi Hashino, Mutsuki Takeuchi, Masatoshi Hiraoka,
  Tsuyoshi Kitani, and Mikio Aoyama

Session 4C: Novel Techniques

SaaS Application Framework Using Information Gateway Enabling Cloud
Service with Data Confidentiality ........................................................................................................ 334
  Kiyoshi Nishikawa, Kenji Oki, and Akibiko Matsuo

Towards Accurate Monitoring of Extra-Functional Properties in Real-Time
Embedded Systems .......................................................................................................................... 338
  Mehrdad Saadatmand and Mikael Sjödin

Implementing Virtual Agent as an Interface for Smart Home Voice Control .................................. 342
  Shimpei Soda, Masahide Nakamura, Shinsuke Matsumoto, Shintaro Izumi,
  Hiroshi Kawaguchi, and Masahiko Yoshimoto

Determining and Selecting the Optimal Sets of Risk Treatments under Project
Constraints ....................................................................................................................................... 346
  Tak Wab Kwan and Bryan Cheung

Session 5A: Empirical Software Engineering I

Validating the Effectiveness of Object-Oriented Metrics over Multiple Releases
for Predicting Fault Proneness ............................................................................................................ 350
  Santosh Singh Rathore and Atul Gupta

An Empirical Study of Reliability Growth of Open versus Closed Source
Software through Software Reliability Growth Models .................................................................... 356
  Najeeb Ullah and Maurizio Morstio

An Empirical Analysis of the Impact of Comment Statements on Fault-Proneness
of Small-Size Module ....................................................................................................................... 362
  Hirohsa Aman
Diffusion of Software Features: An Exploratory Study ................................................................. 368
Ferdian Thung, David Lo, and Lingxiao Jiang

Incorporating Expert Judgment into Regression Models of Software Effort Estimation ......................................................................................................................... 374
Masateru Tsunoda, Akito Monden, Jacky Keung, and Kenichi Matsumoto

A Model-Driven Prototype Evaluation to Elicit Requirements for a Sensemaking Support Tool .................................................................................................................. 380
Fan Yang-Turner, Lydia Lau, and Vania Dimitrova

Session 5B: Empirical Software Engineering II
Software Development Practices in New Zealand .............................................................................. 386
Diana Kirk and Ewan Tempero

An Exploratory Study of API Usage Examples on the Web .................................................................. 396
Lijie Wang, Yanzhen Zou, Lu Fang, Bing Xie, and Fuqing Yang

An Overview of Software Defect Density: A Scoping Study ............................................................. 406
Syed Muhammad Ali Shah, Maurizio Morisio, and Marco Torchiano

Session 6A: Requirements Engineering II
Software Requirements Triage and Selection: State-of-the-Art and State-of-Practice ......................... 416
Mahvish Khurum, Niroopa Uppalapati, and Ramya Chowdary Veeramachaneni

Software Architecture Matching by Meta-model Extension and Refinement ........................................ 422
Luxi Chen, Linpeng Huang, Chen Li, and Weichao Luo

Efficient Modelling of Embedded Software Systems and their Formal Verification .......................... 428
Vladimir Estivill-Castro, René Hexel, and David A. Rosenblueth

Model Transformation Patterns for Introducing Suitable Information Systems ............................... 434
Haruhiko Kaiya, Shunsuke Morita, Shinpei Ogata, Kenji Kaijiri, Shinpei Hayashi, 
and Motoshi Saeki

Chun Liu, Wei Zhang, Haiyan Zhao, and Zhi Jin

Capturing Strategic Business Requirements: An Exploratory Study ................................................. 446
Abdul Babar and Bernard Wong

Session 6B: Software Systems and Management
An Integrated Risk Analysis Method Using Spatial Interpolation .................................................... 452
Peng Zhou and Hareton K.N. Leung

Who is Accountable for Asynchronous Exceptions? .............................................................................. 462
Benjamin Morandi, Sebastian Nanz, and Bertrand Meyer
Session 7A: Formal Methods II

Behavioural Analysis for Distributed Simulations .................................................. 482
   Patrice Carle, Christine Choppy, Romain Kervarc, and Ariane Piel
Extending Linden Scripting Language on OpenSim ................................................. 488
   Bo Sun, Xiaohong Zhang, and Hao Wu
Architecture Based Development with DYNACOMM: Incorporating Dynamic
Reconfiguration and Hierarchical Design into CommUnity ...................................... 492
   Xiang Ling and Tom Maibaum
Calculating Preconditions for Parallel Workflows ................................................ 49
   Chen-Wei Wang
A Formal Approach for the Iterative Design of Behavioural Models ......................... 505
   Chen-Wei Wang
Invariant-preserved Transformation of State Machines from Equations
into Rewrite Rules ........................................................................................................... 511
   Min Zhang and Kazuhiko Ogata

Session 7B: Software Maintenance and Evolution II

Comparison of Seven Bug Report Types: A Case-Study of Google Chrome
Browser Project ............................................................................................................. 517
   Sangeeta Lai and Ashish Sureka
Javelus: A Low Disruptive Approach to Dynamic Software Updates ......................... 527
   Tianxiao Gu, Chun Cao, Chang Xu, Xiaoxing Ma, Linghao Zhang, and Jian Lu
Pattern-Based Dynamic Maintenance of Software Systems ..................................... 537
   Hadaytullah, Allan Gregersen, and Kai Koskimies

Session 8A: Software Analysis, Understanding and Quality Measurement

Software Feature Location Based on Topic Models .................................................. 547
   Kunming Nie and Li Zhang
A Verification Method of Elicited Software Requirements Using Requirements
Ontology ......................................................................................................................... 553
   Dang Viet Dzung and Atsushi Ohnishi
Permission Assurance for Semantic Aspects of Design Patterns ............................... 559
   Yang Zhao, Lingnan Song, Gongxuan Zhang, and John Boyland
Software Project Team Characteristics and Team Performance: Team Motivation
as a Moderator .............................................................................................................. 565
   Pei-Chi Chen, Ching-Chin Chern, and Chung-Yang Chen
An Approach to Estimating Cost of Running Cloud Applications Based on AWS ........................................571
   Huibong He, Zbiyi Ma, Xiang Li, Hongjie Chen, and Weizhong Shao

A Case Study on Specifying Quality Requirements Using a Quality Model ........................................577
   K. Lochmann, D. Méndez Fernández, and S. Wagner

Session 8B: Software Architecture and Design
A Change Impact Analysis Approach for the Software Development Phase ........................................583
   Nazri Kama and Faizul Azli

Studying the Understandability of Aspect State Machines through the Weaving Activity ................................593
   Shaukat Ali and Tao Yue

Towards Tool Integration through Artifacts and Roles .................................................................603
   Weiqing Zhang, Vincent Leilde, Birger Møller-Pedersen, Joël Champeau,
   and Christophe Guychard

Session 9A: Formal Methods III
On Accelerating SMT-based Bounded Model Checking of HSTM Designs ........................................614
   Weiqiang Kong, Leyuan Liu, Yoriyuki Yamagata, Kenji Taguchi, Hitoshi Obsaki,
   and Akira Fukuda

Hybrid Interface Automata .................................................................624
   Yan Zhang and Tian Zhang

Parametric Transformations for Flexible Analysis .................................................................634
   Juliana Bowles and Dulani Meedeniya

Using Monterey Phoenix to Formalize and Verify System Architectures ........................................644
   Jiexin Zhang, Yang Liu, Mikhail Auguston, Jun Sun, and Jin Song Dong

Session 9B: Formal Methods IV
An Approach to Low-fidelity Prototyping Based on SOFL Informal Specification ..........................654
   Fauziab Binti Zainuddin and Shaoying Liu

An Algebraic Approach to Formal Analysis of Dynamic Software Updating Mechanisms .....................664
   Min Zhang, Kazuhiro Ogata, and Kokichi Futatsugi

Proving Liveness Property under Fairness Requirements .............................................................674
   Teng Long and Wenhui Zhang

Debug Concurrent Programs with Visualization and Inference of Event Structure ................................683
   Xiaoquan Wu, Jun Wei, and Xu Wang
Session 10A: Emerging Ideas I

Importance Sampling of Runtime Interference ................................................................. 693
   Shin Nakajima

Model-Based Software Architecture Evolution and Evaluation ............................................. 697
   Ana Dragomir and Horst Lichter

Proactive Enforcement of Data Consistency by Business Processes .................................... 701
   Xi Liu, Jianwen Su, and Xuandong Li

Syntax Map: A Modeling Language for Capturing Requirements of Graphical DSML ............ 705
   Hyun Cho, Jeff Gray, and Eugene Syriani

Understanding OSS Peer Review Roles in Peer Review Social Network (PeRSoN) ............... 709
   Xin Yang, Raula Guikovina Kula, Camargo Cruz Ana Erika, Noribiro Yoshida,
   Kazuki Hamasaki, Kenji Fujiwara, and Hajimu Iida

Toward Comprehension of Side Effects in Framework Applications as Feature Interactions .... 713
   Izuru Kume, Masabide Nakamura, and Etsuya Shibayama

Session 10B: Emerging Ideas II

Mining Software Revision History Using Advanced Social Network Analysis ...................... 717
   Bharath Cheluvaraju, Kartikay Nagal, and Anjaneyulu Pasala

Empowering Non-conservative Parallelizing Refactoring by Non-monotonic Reasoning ........... 721
   Mikhail Chalabine

A Guided Mashup Framework for Rapid Software Analysis Service Composition .................. 725
   Chaman Wijesiriwardana, Giacomo Ghezzi, and Harald Gall

Factorising the Multiple Fault Localization Problem: Adapting Single-Fault Localizer to Multi-fault Programs ................................................................. 729
   Cheng Gong, Zheng Zheng, Yunqian Zhang, Zhenyu Zhang, and Yunzhi Xue

A Visualization Technique for Metrics-Based Hierarchical Quality Models ......................... 733
   Uaychay Chotjaratwanich and Chonlameth Arpnikanondt

Session 11A: Software Process, Quality and Education

A Stochastic Simulation Model for Risk Management Process ............................................. 737
   Peng Zhou and Hareton K.N. Leung

Automated Comparison of Process Improvement Reference Models Based on Similarity Metrics ................................................................. 743
   Simona Jeners, Horst Lichter, and Elena Pyaikova
Execution Plan for Software Engineering Education in Taiwan ................................................................. 749
Jonathan Lee, Alan Liu, Yu Chin Cheng, Shang-Pin Ma, and Shin-Jie Lee

Analysis of Adaptive Policy-Based Approach to Avoid Policy Conflicts .......................................................... 754
Abdembamid Abdelbadi Mansor, Wan M. N. Wan Kadir, Toni Anwar, and Shamsul Sabibuddin

Assessing Platform Suitability for Achieving Quality in Guest Applications ..................................................... 760
Balwinder Sodbi and T.V. Prabhakar

Augmenting Product Lines ....................................................................................................................................... 766
Xiaorui Zhang, Øystein Haugen, and Birger Møller-Pedersen

**Session 11B: Software Quality Assurance and Component-Based Systems**

Towards a Better Understanding of Testing if Conditionals ....................................................................................... 772
Shimal Kumar Natb, Robert Merkel, Man Fai Lau, and Tanay Kanti Paul

Search Based Combinatorial Testing .......................................................................................................................... 778
Changbai Nie, Huayao Wu, Yalan Liang, Hareton Leung, Fei-Ching Kuo, and Zheng Li

Modeling Executable Test Actors: Exploratory Study Done in Executable and Translatable UML ....................................... 784
Rogardt Heldal, Daniel Arvidsson, and Fredrik Persson

PBDDR: Probe-Based Deadlock Detection and Recovery Strategy for Component-Based Systems ........................................... 790
Chen Li, Linpeng Huang, Luxi Chen, Weichao Luo, and Xu Li

A Graph-Based Approach to Web Service Matchmaking ......................................................................................... 796
Shang-Pin Ma and Jonathan Lee

BuOA: An Architecture Style for Modular Web Applications ...................................................................................... 802
Wei Ye, Ruici Luo, Shikun Zhang, Xueyang Liu, and Wenhui Hu

**Session 12A: Empirical Software Engineering III**

Assessing the Representativeness of Open Source Projects in Empirical Software Engineering Studies ................................ 808
Hao Zhong, Ye Yang, and Jacky Keung

Investigating the Use of Duration-Based Moving Windows to Improve Software Effort Prediction .................................. 818
Chris Lokan and Emilia Mendes

Classification of Software Transfers .......................................................................................................................... 828
Claes Woblin and Darja Šmite

A Heuristic Rule Reduction Approach to Software Fault-proneness Prediction ......................................................... 838
Akito Monden, Jacky Keung, Shuji Morisaki, Yasutaka Kamei, and Ken-Ichi Matsumoto
Session 12B: Web-Based Software Engineering

Automated Insertion of Exception Handling for Key and Referential Constraints ........................................848  
   Kaiping Liu and Hee Beng Kuan Tan

Data Dependency Based Trust Evaluation for BPEL Processes .................................................................857  
   Cuicui Liu, Bixin Li, Shanshan Qi, Xiaona Wu, and Rui Song

Engineering an Open-Web Educational Game Design Environment .........................................................867  
   Navid Ahmadi, Mehdi Jazayeri, and Alexander Repenning

Web Platform API Design Principles and Service Contract ........................................................................877  
   Yonghong Chen, Xiwei Xu, and Liming Zhu

Author Index .................................................................................................................................................887