Message from the General Chair ................................................................. xi
Message from the Program Committee Chair ........................................ xii
QSIC 2006 Conference Committees .......................................................... xiii
ISEAT 2006 Workshop Committees ............................................................ xvi

//Panel Summary//

Do We Really Have Provable Best Practices That Ensure Software Quality? ........................................ 3
J. Barrie Thompson

//Keynote Speeches//

Distributed Software Engineering: A Rigorous Architectural Approach ............................................. 7
Jeff Kramer, UK

Government R&D Programs on Software Technology ..................................................................... 10
Xiaohan Liao, China

Helping End-User Programmers “Engineer” Dependable Software ............................................... 11
Gregg Rothermel, USA

Session 1A//Quality Attributes Measurement and Analysis 1

Application of a Statistical Methodology to Simplify Software Quality Metric Models Constructed Using Incomplete Data Samples ........................................................................ 15
Victor K. Y. Chan, W. Eric Wong, and T. F. Xie
An Event-Driven Adaptive Differentiated Service Web Container Architecture ........................................... 22
Yang Li, Ningjiang Chen, and Tao Huang

Object-Relational Database Metrics Formalization ..................................................................................... 30
Aline Lúcia Baroni, Coral Calero, Fernando Brito e Abreu, and Mario Piattini

Control-Flow Analysis and Representation for Aspect-Oriented Programs .................................................. 38
Jianjun Zhao

Session 1B//Validation and Verification 1

Automating Invariant Verification of Behavioral Specifications ................................................................. 49
Masahiro Nakano, Kazuhiro Ogata, Masaki Nakamura, and Kokichi Futatsugi

A Method for Realizing Software Architecture Design ................................................................................. 57
Yujian Fu, Zhijiang Dong, and Xudong He

Correctness-Preserving Synthesis for Real-Time Control Software ............................................................. 65
Jinfeng Huang, Jeroen Voeten, and Henk Corporaal

Asynchronous Semantics and Anti-patterns for Interacting Web Services ................................................... 74
Yongyan Zheng and Paul Krause

Session 1C//Software Testing 1

On Random Testing of Image Processing Applications ............................................................................... 85
Johannes Mayer and Ralph Guderlei

The Design of Dependency Relationships Matrix to Improve the Testability of Component-Based Software .......................................................... 93
Liangli Ma, Houxiang Wang, and Yansheng Lu

Improving Coverage in Functional Testing ................................................................................................. 99
Jessica Chen, Guy-V. Jourdan, Wenxin Ma, and Hasan Ural

A Test Data Generation Tool for Unit Testing of C Programs .................................................................... 107
Zhongxing Xu and Jian Zhang

Session 2A//Requirements Engineering

Co-evolution of i* Models and 3APL Agents ................................................................................................. 117
Aneesh Krishna, Ying Guan, and Aditya K. Ghose

PORTAM: Policy, Requirements and Threats Analyzer for Mobile Code Application .................................. 125
Haruhiko Kaiya, Kouta Sasaki, and Kenji Kaijiri

An Empirical Study on the Likelihood of Adoption in Practice of a Size Measurement Procedure for Requirements Specification .................................................. 133
Nelly Condori-Fernández and Oscar Pastor
Session 2B// Formal Methods

Model-Based Self-Adaptive Embedded Programs with Temporal Logic Specifications ........................................................... 151
   Li Tan

Representing Extended Finite State Machines for SDL by a Novel Control Model of Discrete Event Systems ...................................................... 159
   Peng Wang and Kai-Yuan Cai

Automatic Visualization of Abstract System Specifications .................................................. 167
   Axel Schneider, Stephan Walter, Jan Langer, and Ulrich Heinkel

View Integration in Data Warehouse Design Using Typed Abstract State Machines and Strong Data Refinement .................................................. 175
   Hui Ma, Klaus-Dieter Schewe, and Jane Zhao

Session 3A// Quality Management

Static Slicing for Pervasive Programs ........................................................................ 185
   Heng Lu, W.K. Chan, and T.H. Tse

Managing Quality of Context in Pervasive Computing ................................................ 193
   Yingyi Bu, Tao Gu, Xianping Tao, Jun Li, Shaxun Chen, and Jian Lu

Industrial Perspective on the Usefulness of Design Rationale for Software Maintenance: A Survey .................................................. 201
   Muhammad Ali Babar, Antony Tang, Ian Gorton, and Jun Han

Software Project Level Estimation Model Framework Based on Bayesian Belief Networks ................................................................. 209
   Hao Wang, Fei Peng, Chao Zhang, and Andrej Pietschker

Session 3B// Software Architecture, Pattern and Framework

A Modeling Framework for Service-Oriented Architecture ........................................ 219
   Tao Zhang, Shi Ying, Sheng Cao, and Xiangyang Jia

Quality Assessment of Mutation Operators Dedicated for C# Programs ...................... 227
   Anna Derezińska

A Reflection Mechanism for Reusing Software Architecture ........................................ 235
   Shi Ying, ZaoQing Liang, JunLi Wang, and FuDi Wang

A Quantitative Context Model of Software Process Patterns and Its Application Method .................................................. 243
   Jiakuan Ma and Yasha Wang
Session 3C// Software Testing 2

Adaptive Random Testing with Enlarged Input Domain ................................................................. 251
Johannes Mayer and Christoph Schneckenburger

Generating Optimal Test Set for Neighbor Factors Combinatorial Testing ........................................... 259
Nie Changhai, Xu Baowen, Wang Ziyuan, and Shi Liang

Optimal Synchronizable Test Sequence from Test Segments ................................................................. 266
J. Chen and L. Duan

Probabilistic Adaptive Random Testing .................................................................................................... 274
Kwok Ping Chan, T.Y. Chen, and Dave Towey

Session 4A// Quality Attributes Measurement and Analysis 2

Defect Prevention: A General Framework and Its Application................................................................. 281
Li Meng, Xiaoyuan He, Sontakke Ashok

Early Usability Evaluation in Model Driven Architecture Environments .................................................... 287
Silvia Abrahão and Emilio Insfran

An Approach to Composing Multiple Component Implementations for Satisfying Quality Requirements ................................................................................................................................. 295
Jie Yang, Gang Huang, Li Zhou, Zhao Liu, Meng Ye, and Ying Chen

An Adaptive Caching Mechanism for Web Services ................................................................................ 303
Lei Li, Chunlei Niu, Haoran Zheng, and Jun Wei

Session 4B//Validation and Verification 2

Verification Framework for Dynamic Collaborative Services in Service-Oriented Architecture ................................................................. 313
W. T. Tsai, Qian Huang, Bingnan Xiao, and Yinong Chen

Modularly Certified Dynamic Storage Allocation in SCAP ........................................................................ 321
Sen Xiang, Yiyun Chen, Chuxiao Lin, and Long Li

A Semi-empirical Model of Test Quality in Symmetric Testing: Application to Testing Java Card APIs ................................................................................................................................. 329
Arnaud Gotlieb and Patrick Bernard

Software Reliability Metrics Selecting Method Based on Analytic Hierarchy Process ................................................................. 337
Haifeng Li, Minyan Lu, and Qiuying Li
Session 4C//Agile Development and Education

Technical Reviews in Agile Development: Case Mobile-D™ ................................................................. 347
   Henrik Hedberg and Juha Iisakka

Teaching Object-Oriented Systems Analysis to Non-IT Students: A Practical Experience ................................................. 354
   Nor Iadah Yusop

Experiences with PASS: Developing and Using a Programming Assignment aSsessment System ........................................ 360
   Y.T. Yu, C.K. Poon, and M. Choy

Session 5A//Component-Based Systems

A Framework for Extensible Component Customization for Component-Based Software Development .............................................................................................. 369
   Stephen S. Yau, Choksing Taweponsomkiat, and Dazhi Huang

Stochastic Modeling and Quality Evaluation of Component-Based Software Systems ................................................................. 377
   Yunni Xia, Hanpin Wan, Yu Huang, and Chunxiang Xu

Extracting Reusable Object-Oriented Legacy Code Segments with Combined Formal Concept Analysis and Slicing Techniques for Service Integration ........................................ 385
   Zhuopeng Zhang, Hongji Yang, and William C. Chu

Reconstruct the Distributed Transaction Monitor OnceTX ........................................................................ 393
   BeiHong Jin, Gang Li, and Liang Zhang

Session 5B//Model Checking

Formalizing Class Dynamic Software Updating......................................................................................... 403
   Shi Zhang and LinPeng Huang

Dynamic Model Learning Using Genetic Algorithm under Adaptive Model Checking Framework ........................................ 410
   Zhifeng Lai, S.C. Cheung, and Yunfei Jiang

LTL Model Checking via Search Space Partition....................................................................................... 418
   Fei Pu and Wenhui Zhang

Session 2C// ISEAT 2006

Multiagent System for Reputation-Based Web Services Selection ......................................................................... 429
   Hui Wang, Deguo Yang, Yuhui Zhao, and Yuan Gao

Proper Use of Agent Technologies in Design and Implementation of Software Intensive Systems .................................................................................... 435
   Rune Gustavsson
Evaluation and Research of Strong Migration of Mobile Agent for Exploiting Type Inference .......................................................... 441
   Donghong Qin and Zhi Li

Co-evolution of Agent Oriented Conceptual Models and Use Case Diagrams ................................. 446
   Mohammad M R Bhuiyan, M M Zahidul Islam, Aneesh Krishna, and Aditya Ghose

Towards a Service Requirements Ontology on Knowledge and Intention ................................... 452
   Lin Liu, Qiang Liu, Chi-hung Chi, Zhi Jin, and Eric Yu

Author Index ................................................................................................................................. 463