The 25th Anniversary
Annual International Computer Software and Applications Conference

COMPSAC 2001

Chicago, Illinois, USA, October 8–12, 2001

Standing Committee Chair
Stephen S. Yau, Arizona State University, USA

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Arif Ghafoor, Purdue University, USA
Albert K. Hawkes, Software Engineering Associates, USA
Xudong He, Florida International University, USA
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Nader Kameli, Guidant Corporation, USA
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Arnold Kwong, Independent Consultant, USA
T.Y. Lin, San Jose State University, USA
Rachel McCrindle, The University of Reading, UK
Bruce McMillin, University of Missouri-Rolla, USA
Hong Mei, Peking University, China
Kiyoo Nakamura, Alpha Systems, Inc., Japan
Akira K. Onoma, Hosei University, Japan
Guenther Ruhe, Fraunhofer Institute for Experimental Software Engineering, Germany
Dick B. Simmons, Texas A&M University, USA
Bhavani Thuraisingham, MITRE Corp., USA
Jeffrey Tsai, University of Illinois at Chicago, USA
Wei-Tek Tsai, Arizona State University, USA
K. Vairavan, University of Wisconsin, Milwaukee, USA
Jeffrey Voas, Cigital, USA
Eric Wong, Telcordia Technologies, USA
Jim Woodcock, University of Oxford, UK
Baowen Xu, Southeast University, China
Hongji Yang, De Montfort University, UK
I-Ling Yen, University of Texas at Dallas, USA
Y.T. Yu, City University of Hong Kong, Hong Kong
Hong Zhu, Oxford Brookes University, UK

Registration Chair
Peter Wu, Arizona State University, USA

Local Arrangements Chair
Jeff Knopp, Philips Semiconductors, USA

Audio-Visual Chair
Yong (John) Liu, Lucent Technologies, USA

Welcome to the Twenty-Fifth Anniversary of the **Annual International Computer Software and Applications Conference (COMPSAC 2001)**.

COMPSAC is the major international forum for researchers, practitioners, managers, and policy makers interested in computer software and applications. It was first held in Chicago in 1977 and we are celebrating its silver jubilee in the same city in 2001. The expanded anniversary program will include original research papers, industrial case studies, participative workshops, discussion panels, and professional development seminars.

COMPSAC 2001 At-a-Glance

Monday, October 8, 2001

9:00 am – 10:30 am	Opening Session	*Room Pine*
11:00 am – 12:30 pm	Parallel Sessions 1	*Rooms Aspen, Redwood, Rosewood, Cypress*
2:00 pm – 3:30 pm	Parallel Sessions 2	*Rooms Aspen, Redwood, Rosewood*
4:00 pm – 5:30 pm	Parallel Sessions 3	*Rooms Aspen, Redwood, Rosewood, Cypress*
5:30 pm – 7:00 pm	Conference Reception	*Room Pine*

Tuesday, October 9, 2001

9:00 am – 10:30 am	Plenary Session 1	*Room Pine*
11:00 am – 12:30 pm	Parallel Sessions 4	*Rooms Aspen, Redwood, Rosewood, Cypress*
2:00 pm – 3:30 pm	Parallel Sessions 5	*Rooms Aspen, Redwood, Rosewood, Cypress*
4:00 pm – 5:30 pm	Parallel Sessions 6	*Rooms Aspen, Redwood, Rosewood, Cypress*

Wednesday, October 2001

9:00 am – 10:30 am	Plenary Session 2	*Room Pine*
2:00 pm – 5:30 pm	Half-Day Workshop	*Room Pine*
11:00 am – 12:30 pm	Parallel Sessions 7	*Rooms Aspen, Rosewood, Cypress*
2:00 pm – 3:30 pm	Parallel Sessions 8	*Rooms Aspen, Rosewood*
4:00 pm – 5:30 pm	Parallel Sessions 9	*Rooms Aspen, Rosewood*
6:00 pm – 7:00 pm	25th Anniversary Banquet	*Majestic Ballroom*

Thursday, October 11, 2001

9:00 am – 10:30 am	Plenary Session 3	*Majestic Ballroom*
11:00 am – 5:30 pm	Full-Day Workshop	*Room Woods*
11:00 am – 12:30 pm	Parallel Sessions 10	*Rooms Aspen, Cypress*
2:00 pm – 3:30 pm	Parallel Sessions 11	*Rooms Aspen, Cypress*
4:00 pm – 5:30 pm	Parallel Sessions 12	*Rooms Aspen, Cypress*

Friday, October 12, 2001

9:00 am – 12:30 pm	Three Parallel Professional Development Seminars

Professional Development Seminar 1	*Room Aspen*
Professional Development Seminar 2	*Room Woods*
Professional Development Seminar 3	*Room Cypress*

SOCIAL FUNCTIONS

Conference Reception
Room Pine
Monday, October 8, 2001, 5:30 pm - 7:00 pm

25th Anniversary Banquet
Majestic Ballroom
Wednesday, October 10, 2001, 6:00 pm - 8:00 pm

CONFERENCE VENUE

Hilton Lisle / Naperville
3003 Corporate West Drive
Lisle, IL 60532 USA

Telephone: +1 800 552 2599
or +1 630 505 0900
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Monday, October 8, 2001

9:00 am - 10:30 am Opening Session – *Room Pine*

Welcome and Remarks:
General Chair: Terry Heng, Senior Vice President and General Manager, Motorola Global Software Group, USA

Additional Greetings and Remarks:
Standing Committee Chair: Stephen S. Yau, Arizona State University, USA

Program Overview:
Program Chair: T.H. Tse, The University of Hong Kong, Hong Kong

Keynote Address 1:
Always On, Anywhere Computing: Lori Craven, Vice President, Mobility Solutions, Lucent Technologies, USA

10:30 am - 11:00 am	**Coffee Break**
11:00 am - 12:30 pm	**Four Parallel Sessions 1**

Paper Session 1A: Requirements Engineering – *Room Aspen*
Chair: Carl K. Chang, University of Illinois at Chicago, USA

- *Business Rules Specification, Enforcement and Distribution for Heterogeneous Environments:* Daniela Rosca, Monmouth University, USA, and John D'Attilio, Oracle Corporation, USA
- *Visualization Issues for Software Requirements Negotiation:* Hoh In and Siddhartha Roy, Texas A&M University, USA

Paper Session 1B: Component-Based Development – *Room Redwood*
Chair: Hewijin C. Jiau, National Cheng Kung University, Taiwan

- *Component-Based Design of Large-Scale Distributed Systems:* Franck Barbier, University of Pau, France
- *A Configuration Management System Supporting Component-Based Software Development:* Lu Zhang, Oxford Brookes University, UK, Hong Mei, Peking University, China, and Hong Zhu, Oxford Brookes University, UK
- *Converting Web Applications to Data Components: Design Methodology:* Jan Pazdziora, Masaryk University, Czech Republic

Paper Session 1C: Protocols and Harmonization – *Room Rosewood*
Chair: Albert K. Hawkes, Software Engineer Associates, USA

- *A Long and Winding Road (Progress on the Road to a Software Engineering Profession):* J. Barrie Thompson, University of Sunderland, UK
- *Harmonized Conformance Testing for Product Data Managers:* David Flater and K.C. Morris, National Institute of Standards and Technology, USA
- *Exploiting Automatic Analysis of E-Commerce Protocols:* Jun Wei, Shing-Chi Cheung, and Xu Wang, Hong Kong University of Science and Technology, Hong Kong

Panel Session 1D: Large Scale Software Development: What Have We Learned?
Room Cypress
Chair: Bruce Healton, Elegant Technology Solutions, Inc., USA
Panelists: Paul R. Cole, Wavetech.net, USA
Birket Foster, MB Foster Associates Ltd., USA
Frank Hill, M2Direct, USA
Teresa Jenisch, Northern Telecom Global, USA
Chi Lin, Jet Propulsion Labs, USA

12:30 pm - 2:00 pm	**Lunch Break**
2:00 pm - 3:30 pm	**Three Parallel Sessions 2**

Paper Session 2A: Reverse Engineering and Re-Engineering – *Room Aspen*
Chair: William C. Chu, TungHai University, Taiwan

- *ELKAR: A Component Based Re-Engineering Methodology to Provide Cooperation:* Philippe Roose, University of Pau, France
- *JBOORET: An Automated Tool to Recover OO Design and Source Models:* Hong Mei, Tao Xie, and Fuqing Yang, Peking University, China
- *MOOSE: A Task-Driven Program Comprehension Environment:* Juergen Rilling and Ahmed Seffah, Concordia University, Canada

Paper Session 2B: Quality Management – *Room Redwood*
Chair: Hong Zhu, Oxford Brookes University, UK

- *Investigating Reinspection Decision Accuracy Regarding Product-Quality and Cost-Benefit Estimates:* Stefan Biffl and Michael Halling, Vienna University of Technology, Austria
- *A Memory-Based Reasoning Approach for Assessing Software Quality:* Raymond A. Paul, Office of the Assistant Secretary of Defense, USA, Venkata U.B. Challagulla, Farokh B. Bastani, and I-Ling Yen, The University of Texas at Dallas, USA
- *Quality Planning for Software Development:* Tom Walton, Acatel Canada, Canada

Panel Session 2C: Software Architecture: Impact on Software Development
Room Rosewood
Chair: Dennis Mulcare, Telcordia Technologies, Inc., USA
Panelists: Maarten Boasson, University of Amsterdam, The Netherlands
Christine Hofmeister, Lehigh University/Siemens, USA
Rick Kazman, Software Engineering Institute, USA
Rick Schantz, BBN Technologies, USA

3:30 pm - 4:00 pm	**Coffee Break**
4:00 pm - 5:30 pm	**Four Parallel Sessions 3**

Paper Session 3A: Workflow Systems – *Room Aspen*
Chair: Hongji Yang, De Montfort University, UK

- *Designing Role Hierarchies for Access Control in Workflow Systems:* Reinhardt A. Botha and Jan H.P. Eloff, Port Elizabeth Technikon, South Africa
- *Retrofitting Workflows for B2B Assembly:* Alistair P. Barros and Arthur H.M. ter Hofstede, The University of Queensland, Australia, and Clemens Szyperski, Microsoft Research, USA
- *A Stage-Activity Process Model Facilitating Workflow Management for Web Publishing:* Jiannong Cao, Catherine Chan, and Keith Chan, The Hong Kong Polytechnic University, Hong Kong

Paper Session 3B: Software Architecture – *Room Redwood*
Chair: Brian Henderson-Sellers, University of Technology, Sidney, Australia

- *An Architectural Model for Service-Based Flexible Software:* Keith Bennett, Jie Xu, Malcolm Munro, and Zhuang Hong, University of Durham, UK, Paul Layzell, UMIST, UK, Nicolas Gold, University of Durham, UK, and David Budgen and Pearl Brereton, Keele University, UK
- *Formal Design of Real-Time Components on a Shared Data Space Architecture:* Ulrich Hannemann and Jozef Hooman, University of Nijmegen, The Netherlands
- *Information Theoretic Metrics for Software Architectures:* Mark Shereshevsky, Habib Ammari, Nicholay Gradetsky, Ali Mili, and Hany H. Ammar, West Virginia University, USA

Panel Session 3C: Does SEI Level 5 Lead to High Quality Software?
Room Rosewood
Chair: Bob Yacobellis, Motorola Global Software Group, USA
Panelists: Barbara Hirsh, Motorola, USA
Jim Connor, Motorola, USA
Girish Seshagiri, Advanced Information Services, Inc., USA
Mark Paulk, Software Engineering Institute, USA

Panel Session 3D: Telecommunications Software: Age before Beauty?
Room Cypress
Chair: Arnold Kwong, Independent Consultant, USA
Panelists: Teresa Jenisch, Northern Telecom Global, USA
David Mastbaum, Aventail, USA
John McGuthry, Telcordia, USA
Ed Powell, Community Fiber, USA

Tuesday, October 9, 2001

9:00 am - 10:30 am   Plenary Session 1 – *Room Pine*
Chair: Raymond A. Paul, Office of the Assistant Secretary of Defense, USA

Keynote Address 2: *Design and Anti-Design in the Birth of the World-Wide Web: Stories of Software Engineering for the Web before Standards:* Tim Krauskopf, Vice President and General Manager, Core Solutions, Internet Software and Content Group, Motorola, USA

10:30 am - 11:00 am	**Coffee Break**
11:00 am - 12:30 pm	**Four Parallel Sessions 4**

Paper Session 4A: Software Testing 1 – *Room Aspen*
Chair: Akira K. Onoma, Hosei University, Japan

- *Automatic Generation of Database Instances for White-Box Testing:* Jian Zhang and Chen Xu, The Chinese Academy of Sciences, China, and Shing-Chi Cheung, Hong Kong University of Science and Technology, Hong Kong
- *End-To-End Integration Testing Design:* Wei-Tek Tsai and Xiaoying Bai, Arizona State University, USA, Raymond A. Paul, Office of the Assistant Secretary of Defense, USA, Weiguang Shao and Vishal Agarwal, University of Minnesota, USA, and Techeng Sheng, Bing Li, and Jyothishree Honnavalli, Arizona State University, USA
- *Fault-Based Testing in the Absence of an Oracle:* T.Y. Chen, Swinburne University of Technology, Australia, and T.H. Tse and Zhiquan Zhou, The University of Hong Kong, Hong Kong

Paper Session 4B: Distributed Systems 1 – *Room Redwood*

Chair: Maarten Boasson, University of Amsterdam, The Netherlands

- *A Windows CE Implementation of a Middleware Architecture Supporting Time-Triggered Message Triggered Objects:* Galo Gimenez, Hewlett-Packard, USA, and Kane H. Kim, University of California at Irvine, USA

- *Certificate Based Authorization Simulation System:* Jie Dai and Jim Alves-Foss, University of Idaho, USA

- *An Election Based Approach to Fault-Tolerant Group Membership in Collaborative Environments:* James S. Pascoe and Roger J. Loader, The University of Reading, UK, and Vaidy S. Sunderam, Emory University, USA

Paper Session 4C: Unified Modeling Language (UML) – *Room Rosewood*

Chair: Shing-Chi Cheung, Hong Kong University of Science and Technology, Hong Kong

- *Automated Generation of Statistical Test Cases from UML State Diagrams:* Philippe Chevalley and Pascale Thevenod-Fosse, LAAS-CNRS, France

- *Formal and Use-Case Driven Requirement Analysis in UML:* Xiaoshan Li, The University of Macau, Macau, and Zhiming Liu and Jifeng He, The United Nations University International Institute for Software Technology, Macau

- *Model Driven Process Engineering:* Erwan Breton, University of Nantes, France, and Jean Bezivin, Societe Soft-Maint, France

Panel Session 4D: Designing Process: Taming the Web Development Cycle

Room Cypress

Chair: Adam Steele, DePaul University, USA

Panelists: Roymieco A. Carter, DePaul University, USA
Abbey Kuster, Graphic and Web Designer, NYC, USA
Jamie Prokell, Multimedia Designer, NYC, USA

12:30 pm - 2:00 pm	Lunch
2:00 pm - 3:30 pm	Four Parallel Sessions 5

Paper Session 5A: Safety and Security – *Room Aspen*

Chair: Bruce McMillin, University of Missouri-Rolla, USA

- *Back-End Software for Highly Dependable Real-Time Control Systems:* Yaroslav Domaratsky, Motorola Global Software Group, USA, and Maxim Perevozchikov, Alexander Ingulets, and Alexander Alkhovik, Motorola Global Software Group, Russia

- *EC-SignGate:* Electronic Contract Signing Gateway: Man-Chi Pong, The University of Hong Kong, Hong Kong

- *A Novel Intrusion Detection System Model for Securing Web-Based Database Systems:* Wenhui Shu and Daniel T.H. Tan, Nanyang Technological University, Singapore

Paper Session 5B: Distributed Systems 2 – *Room Redwood*

Chair: Kinji Mori, Tokyo Institute of Technology, Japan

- *A Quantitative Comparison of Load Balancing Approaches in Distributed Object Computing Systems:* Lap-Sun Cheung and Yu-Kwong Kwok, The University of Hong Kong, Hong Kong

- *Context-Sensitive Distributed Software Development for Ubiquitous Computing Environments:* Stephen S. Yau and Fariaz Karim, Arizona State University, USA

- *QAME: QoS-Aware Management Environment:* Lisandro Zambenedetti Granville and Liane Margarida Rockenbach Tarouco, Federal University of Rio Grande do Sul, Brazil

Panel Session 5C: Formalizing UML Semantics – *Room Rosewood*

Chair: Xudong He, Florida International University, USA

Panelists: Betty H.C. Cheng, Michigan State University, USA
Robert France, Colorado State University, USA
Sol Shatz, The University of Illinois at Chicago, USA

Panel Session 5D: End-to-End Integration Testing – *Room Cypress*

Chair: Wei-Tek Tsai, Arizona State University, USA

Panelists: Amrit Goel, Syracuse University, USA
Hong Mei, Peking University, China
Raymond A. Paul, Office of the Assistant Secretary of Defense, USA

3:30 pm - 4:00 pm	Coffee Break
4:00 pm - 6:15 pm	Four Parallel Sessions 6

Paper Session 6A: Commercial Off-The-Shelf Components – *Room Aspen*

Chair: I-Ling Yen, University of Texas at Dallas, USA

- *DSIAS: A Software Architectural Style for Distributed Software Integration Systems:* Zen-Wei Hong and Jim-Min Lin, Feng Chia University, Taiwan, Hewijin C. Jiau, National Cheng Kung University, Taiwan, and De-Sheng Chen, Feng Chia University, Taiwan

- *Empirical Software Simulation for COTS Glue Code Development and Integration:* Jongmoon Baik and Nancy Eickelmann, Motorola Labs, USA, and Chris Abts, University of Southern California, USA

- *Metrics-Guided Quality Management for Component-Based Software Systems:* Sahra Sedigh-Ali and Arif Ghafoor, Purdue University, USA, and Raymond A. Paul, Office of the Assistant Secretary of Defense, USA

Paper Session 6B: Process Case Studies – *Room Redwood*

Chair: Stephen Chen, Motorola Global Software Group, USA

- *E-ADOME: Enacting Composite E-Services in an Advanced Workflow Environment:* Dickson K.W. Chiu, Dickson Computer Systems, Hong Kong, Kamalakar Karlapalem, Indian Institute of Information Technology, India, and Qing Li, City University of Hong Kong, Hong Kong

- *An Empirical Study of Software Productivity:* Sandro Morasca, Universita degli Studi dell'Insubria, Italy, and Giuliano Russo, DPS - SINIT, Italy

- *Test Operation-Driven Approach on Building Regression Testing Environment:* Hiroshi Suganuma, Kinya Nakamura, and Tsutomu Syomura, Hitachi Software Engineering Co., Ltd., Japan

- *Automation of Design and Development of Embedded Software on the Basis of a Strictly Defined Software Architecture:* Sergey Baranov and Vsevolod Kotlyarov, Motorola Global Software Group, Russia

- *An Editing System for Working Processes:* Yin-Shinn Chen and Feng-Jian Wang, National Chiao-Tung University, Taiwan

Panel Session 6C: The Position of E-Learning Application Software

Room Rosewood

Chair: Elsabe Cloete, University of South Africa, South Africa

Panelists: Ugo Buy, The University of Illinois at Chicago, USA
T.Y. Lin, San Jose State University, USA
Pradip Srimani, Clemson University, USA
Peter K. Wiesner, IEEE Educational Activities, USA

Panel Session 6D: 3G and Wireless Infrastructure: Impacts on Developers and Users

Room Cypress

Chair: Arnold Kwong, Independent Consultant, USA

Panelists: Michael McKee, University of Minnesota at Rochester, USA
Ed Powell, Community Fiber, USA
Barry Storm, Storm Technologies, USA

Wednesday, October 10, 2001

9:00 am - 10:30 am   Plenary Session 2 – *Room Pine*

Chair: Terry Heng, Motorola Global Software Group, USA

Keynote Address 3: *Information Technology Research Agenda: New Developments and Ambitions:* Ruzena Bajcsy, Assistant Director, Directorate for Computer and Information Science and Engineering, National Science Foundation, USA

10:30 am - 11:00 am	Coffee Break
11:00 am - 12:30 pm	Three Parallel Sessions 7

Paper Session 7A: Software Testing 2 – *Room Aspen*

Chair: T.H. Tse, The University of Hong Kong, Hong Kong

- *Formalization of Software Testing Criteria Using the Z Notation:* Sergiy A. Vilkomir and Jonathan P. Bowen, South Bank University, UK

- *Integrating White- and Black-Box Techniques for Class-Level Regression Testing:* Sami Beydeda and Volker Gruhn, University of Dortmund, Germany

- *An Observational Theory of Integration Testing for Component-Based Software Development:* Hong Zhu, Oxford Brookes University, UK, and Xudong He, Florida International University, USA

Paper Session 7B: Web-Based Systems – *Room Rosewood*

Chair: K. Vairavan, University of Wisconsin at Milwaukee, USA

- *A Runtime Composite Service Creation and Deployment Infrastructure and its Applications in Internet Security, E-Commerce, and Software Provisioning:* David Mennie, The Bulldog Group, Inc., Canada, and Bernard Pagurek, Carleton University, Canada

- *A Rough Set Based Self-Adaptive Web Search Engine:* Baowen Xu and Weifeng Zhang, Southeast University, China, Hongji Yang, De Montfort University, UK, and William C. Chu, TungHai University, Taiwan

- *Supporting Web Development in the OPEN Process:* Additional Tasks: Brendan Haire, Brian Henderson-Sellers and David Lowe, University of Technology, Sydney, Australia

Panel Session 7C: What are the Missing Elements in SE Research and What Next?
Room Cypress
Chair: Franck Xia, University of Missouri-Rolla, USA
Panelists: David Budgen, Keele University, UK
 Jeffrey Voas, Cigital, Inc., USA
 Lawrence Votta, Motorola, USA
 Marvin Zelkowitz, University of Maryland, USA

| 12:30 pm - 2:00 pm | Lunch |
| 2:00 pm - 3:30 pm | Two Parallel Sessions 8 |

Paper Session 8A: Object-Oriented Development – *Room Aspen*
Chair: Jeffrey Voas, Cigital, Inc., USA
* *The Exu Approach to Safe, Transparent and Lightweight Interoperability:* John F. Bubba and Alan Kaplan, Clemson University, USA, and Jack C. Wileden, University of Massachusetts, USA
* *Task and Team Management in the Distributed Software Project Management Tool:* Hai Eric Lam and Piyush Maheshwari, The University of New South Wales, Australia
* *Utilizing Object-Oriented Databases for Concurrency Control in Virtual Environments:* Damla Turgut, Nevin Aydin, Ramez Elmasri, and B. Turgut, The University of Texas at Arlington, USA

Paper Session 8B: Embedded Systems – *Room Rosewood*
Chair: Baowen Xu, Southeast University, China
* *Algebraic Transformations in Regular Array Design:* Toomas P. Plaks, South Bank University, UK
* *A Case Study on Formal Design of Hybrid Control Systems:* Hong Ki Thae and Dang Van Hung, The United Nations University International Institute for Software Technology, Macau
* *Reducing Matching Time for OPS5 Production Systems:* Jeong A. Kang and Albert M.K. Cheng, University of Houston, USA

| 3:30 pm - 4:00 pm | Coffee Break |
| 4:00 pm - 5:30 pm | Two Parallel Sessions 9 |

Paper Session 9A: Agent Technology and Frameworks – *Room Aspen*
Chair: Jeffrey Tsai, University of Illinois at Chicago, USA
* *Accomplishing Adaptability in Simulation Frameworks: The Bubble Approach:* J. Andres Diaz Pace, Federico U. Trilnik and Marcelo R. Campo, Universidad Nacional del Centro de la Provincia de Buenos Aidres, Argentina, and Mohamed E. Fayad, University of Nebraska, USA
* *Dealing with Denial-of-Service Attacks in Agent-Enabled Active and Programmable Infrastructures:* Stamatis Karnouskos, German National Research Center for Information Technology, Germany
* *Implementing an Agent System Using N-Tier Pattern-Based Framework:* William C. Chu, Juei-Nan Chen, and Chun-Yuan Lee, TungHai University, Taiwan, and Hongji Yang, De Montfort University, UK

Paper Session 9B: Industry Application Case Studies – *Room Rosewood*
Chair: Nader Kameli, Guidant Corporation, USA
* *An Application of Data Warehouse Technology to the Measurement System for UML-Based Artifacts:* Taku Fujii, OGIS-RI Co., Ltd., Japan, and Yahiko Kambayashi, Kyoto University, Japan
* *Availability Requirement for Fault Management Server:* James J. Han, Hairong Sun, and Haim Levendel, Motorola, USA
* *InfoSleuth: Agent-Based System for Data Integration and Analysis:* Tomasz Ksiezyk, Gale Martin, and Qing Jia, Motorola Global Software Group, USA
* *Java in Industrial Automation: A Virtual PLC:* Mario Grabner, Gerhard Leonhartsberger, Alexander Leutgeb, and Josef Altmann, Software Competence Center Hagenberg, Austria

Thursday, October 11, 2001

9:00 am - 10:30 am   **Plenary Session 3** – *Majestic Ballroom*
Chair: Stephen S. Yau, Arizona State University, USA

Plenary Panel: *Trends of Software Technology to Meet the Changing World*

Panelists: Terry Heng, Motorola Global Software Group, USA
 Robert Larson, Woodside Fund, USA
 Dick B. Simmons, Texas A&M University, USA

| 10:30 am - 11:00 am | Coffee Break |
| 11:00 am - 12:30 pm | Two Parallel Sessions 10 |

Paper Session 10A: Software Testing 3 – *Room Aspen*
Chair: T.Y. Chen, Swinburne University of Technology, Australia
* *PePPeR: A New Model to Bridge the Gap between User and Designer Perceptions:* B.M. Subraya, S.V. Subrahmanya, J.K. Suresh, and C. Ravi, Infosys Technologies Limited, India
* *Requirement-Based Automated Black-Box Test Generation:* Luay H. Tahat, Lucent Technologies, USA, Boris Vaysburg, Motorola, USA, Bogdan Korel, Illinois Institute of Technology, USA, and Atef J. Bader, Lucent Technologies, USA
* *Scenario-Based Functional Regression Testing:* Wei-Tek Tsai and Xiaoying Bai, Arizona State University, USA, Raymond A. Paul, Office of the Assistant Secretary of Defense, USA, and Lian Yu, Arizona State University, USA

Paper Session 10B: Data Mining – *Room Cypress*
Chair: Shirley Williams, The University of Reading, UK
* *An Efficient Clustering Algorithm for Market Basket Data Based on Small Large Ratios:* Ching-Huang Yun, Kun-Ta Chuang, and Ming-Syan Chen, National Taiwan University, Taiwan
* *An Efficient Hash-Based Method for Discovering the Maximal Frequent Set:* Don-Lin Yang, Ching-Ting Pan, and Yeh-Ching Chung, Feng Chia University, Taiwan
* *Mining Market Value Functions for Targeted Marketing:* Y.Y. Yao and Ning Zhong, Maebashi Institute of Technology, Japan

| 12:30 pm - 2:00 pm | Lunch |
| 2:00 pm - 3:30 pm | Two Parallel Sessions 11 |

Paper Session 11A: Metrics and Measurement – *Room Aspen*
Chair: Hans-Ludwig Hausen, German National Research Center for Information Technology (GMD), Germany
* *An Assessment Approach to Analyzing Benefits and Risks of Product Lines:* Klaus Schmid, Fraunhofer Institute for Experimental Software Engineering, Germany
* *CLPKIDS: A Program Analysis System for Concurrent Logic Programs:* Jianjun Zhao, Fukuoka Institute of Technology, Japan, and Jingde Cheng and Kazuo Ushijima, Kyushu University, Japan
* *Measuring the Intensity of Object Coupling in C++ Programs:* Chia-Song Ma, Carl K. Chang, and Jane Cleland-Huang, University of Illinois at Chicago, USA

Paper Session 11B: Extensible Markup Language (XML) – *Room Cypress*
Chair: David Budgen, Keele University, UK
* *Building and Managing XML/XSL-Powered Web Sites: An Experience Report:* Clemens Kerer, Engin Kirda, Mehdi Jazayeri, and Roman Kurmanowytsch, Technical University of Vienna, Austria
* *Using SOAP to Clean up Configuration Management:* Paul O'Connell and Rachel McCrindle, The University of Reading, UK
* *An XML-Message Based Architecture Description Language and Architectural Mismatch Checking:* Bo Zhang, Ke Ding, and Jing Li, The Chinese Academy of Sciences, China

| 3:30 pm - 4:00 pm | Coffee Break |
| 4:00 pm - 5:30 pm | Two Parallel Sessions 12 |

Paper Session 12A: Design Patterns and Frameworks – *Room Aspen*
Chair: Wei-Tek Tsai, Arizona State University, USA
* *An Unsupervised Segmentation Framework for Texture Image Queries:* Shu-Ching Chen, Florida International University, USA, Mei-Ling Shyu, University of Miami, USA, and Chengcui Zhang, Florida International University, USA
* *Coupling of Design Patterns: Common Practices and their Benefits:* William B. McNatt and James M. Bieman, Colorado State University, USA
* *Exception Handling in Component-Based System Development:* Alexander Romanovsky, University of Newcastle upon Tyne, UK

Paper Session 12B: E-Commerce – *Room Cypress*
Chair: Rachel McCrindle, The University of Reading, UK
* *Autonomous Decentralized Database System for Assurance in Heterogeneous e-Business:* Carlos Perez Leguizamo, Shohei Kato, Kenji Hirai, and Kinji Mori, Tokyo Institute of Technology, Japan
* *Multi-Criteria Transaction for E-Commerce Applications:* Peng Li, Jayabharath R. Goluguri, and I-Ling Yen, The University of Texas at Dallas, USA, and Ann Tai, IA Tech, Inc., USA
* *Tailoring E-Commerce Sites to Ease Recovery after Disruptions:* Karen Renaud and Tobias van Dyk, University of South Africa, South Africa

COMPSAC 2001 Workshops

2:00 pm - 5:30 pm   **One Half-Day Workshop** – *Room Pine*

Data Mining and E-Organizations
Co-Chairs: T.Y. Lin, San Jose State University, USA,
Shusaku Tsumoto, Shimane Medical University, Japan

Position Papers:

• *Index Miner: A Data Mining System:* I-Jen Chiang, Index Software, San Jose, California, USA, and T.Y. Lin, San Jose State University, USA

• *Melanoma Prediction Using Data Mining System LERS:* Jan P. Grzymala-Busse, Jerzy W. Grzymala-Busse, and Zdzislaw S. Hippe, University of Kansas, USA

• *A Knowledge-Oriented Clustering Technique Based on Rough Sets:* Shoji Hirano, Shimane Medical University, Japan

• *Category-Based Web Personalization System:* Ching-Cheng Lee, California State University at Hayward, USA, and Wei Xu, San Jose State University, USA

• *Decision Logics for Knowledge Representation in Data Mining:* Tuan-Fang Fan and Wu-Chih Hu, National Penghu Institute of Technology, Taiwan, and Chuan-Jung Liau, Academia Sinica, Taiwan

• *The Lattice Structure of Database and Mining Rules of All Levels:* T.Y. Lin, San Jose State University, USA

• *Intelligent Agents: Coordination of Action Rules to Increase Global Profit:* Zbigniew Ras, University of North Carolina, USA

• *Security and Privacy in Virtual Organization:* Bhavani Thuraisingham, The MITRE Corporation, USA

• *Internet-Based Medical Decision Support System:* Shoji Hirano and Shusaku Tsumoto, Shimane Medical University, Japan

• *On Modeling Data Mining with Granular Computing:* Yiyu Yao, University of Regina, Canada

11:00 am - 5:30 pm   **One Full-Day Workshop** – *Room Woods*

Integration of Component-Based Systems: Issues and Solutions
Chair: Stephen Chen, Motorola Global Software Group, USA

Workshop Objective:

The computer industry has been focused on achieving highly reliable systems for many years. Most cases focus on achieving highly reliable system components. The real issue is the successful integration of reliable components into a reliable system. This workshop will present the experiences from a number of projects and will afford participants an opportunity to present their views on how to best solve this problem.

Workshop Plan:

• *Problem Statement:* Stephen Chen, Motorola, USA

• *System Dependability Problems with Integration of COTS (Commercial Off-The-Shelf) Components:* Haim Levendel, Motorola, USA

• *Architectural Support for Integration in Distributed Reactive Systems:* Maarten Boasson, University of Amsterdam, The Netherlands

• *Case Study of Wireless Integration Project:* Anand Sampath, Motorola, USA

• *Roundtable Discussion*

• *Summary of Day's Results*

COMPSAC 2002 Planning Meeting

Monday, October 8, 2001 following
the Conference Reception *(approximately 7:00 p.m.)*
All participants are invited.

Meeting Room to be announced

COMPSAC 2001 Professional Development Seminars

9:00 am - 12:30 pm   **Three Parallel Professional Development Seminars**

Professional Development Seminar 1 – *Room Aspen*

Applied Data Mining
Shirley Williams, *The University of Reading, UK*

Overview

Data Mining is usually used to describe the process of using advanced statistical techniques and/or artificial intelligence to discover knowledge from very large data sets, often with the aid of specialized tools. Data Mining tools are very powerful. But as with all powerful tools they can be dangerous in the wrong hands, careful preparation is essential and sometimes it is safer to use a less powerful tool.

In this seminar we will look at a number of different applications ranging from the traditional to new areas including e-commerce and multimedia.

A commonly cited example is that a supermarket chain using knowledge discovery found an unexpected link between the sales of beer and nappies during the early evening period. Having determined the link they could then experiment with positioning the good so as to maximize sales. E-commerce companies are contemplating different pricing policies depending on the history of the customer. Banks use predictive data mining, they use past data to determine the characteristics of bad credit risks and then apply this discovered knowledge to decide whether or not to lend money to new clients. Multimedia systems can be designed so that knowledge of past usage of the system can be used to predict future access and so reduce the wait time for downloads.

Audience

This seminar is intended to provide professional software engineers with an insight into the knowledge discovery process and the tools available for data mining. It will be of particular interest to those who have not previously been involved in a data mining project but may in the future be called upon to scope such a project.

About the Presenter

Shirley Williams, B.Sc, PhD, FBCS, CEng, is a senior lecturer at the University of Reading, teaching in the area of Software Engineering. She spent the academic year 1999-2000 on sabbatical leave working with Vodafone working on two projects:

• Building a knowledge base for dimensioning exchanges

• Knowledge discovery with engineering applications.

Professional Development Seminar 2 – *Room Woods*

How to Successfully Leverage UML in Real-time Applications: Using SDL and UML Together
Birger Moller-Pedersen and Oystein Haugen, *Ericsson NorARC, USA*
Thomas Weigert, *Motorola Global Software Group, USA*

Overview

The UML has emerged as the software industry's dominant modeling language; but due to its genericity it has not afforded its users the benefits of code generation and design verification that they have come to rely upon when deploying domain-specific languages such as SDL. However, UML and SDL naturally complement each other. While UML has its focus and strength in object oriented data modeling, SDL has its strength in the modeling of concurrent active objects, of the hierarchical structure of active objects, and of their interaction through well-defined interfaces. This seminar aims at giving guidance on how to harness the strengths of UML while maintaining the productivity and quality gains derived from the use of SDL.

This tutorial will address:

• the representation of system functional requirements through UML use cases and high-level class models,

• the transition to system architectures and high-level designs expressed in hierarchical Message Sequence Charts with the aid of Use Case Maps,

• the modeling of architectures and detailed designs in SDL,

• the mapping of artifacts onto implementations through UML deployment diagrams, and the relationship to test cases and data marshalling.

The emphasis will be less on introducing the various notations but on the integration of models utilizing these notations and the transition between the models at the stages of the described workflow. This tutorial will also discuss the impact of the UML 2.0 revision currently under development on this workflow.

Audience

This seminar will aid users who intend to deploy a workflow that combines the use of UML and SDL (and its associated notations). This seminar will be of particular interest to software practitioners developing for domains where system behavior is induced by the interaction of concurrently executing and distributed components.

About the Presenters

*Birger Moller-Pederse*n is principal researcher at Ericsson NorARC and part-time associate professor at University of Oslo. He has worked within standardization of SDL since 1989 and together with Oystein Haugen he initiated the introduction of object orientation into SDL. From 1998 - 2000 he was involved in the standardization of SDL 2000 and responsible for the Z.109 standard on the combined used of SDL and UML. He is co-author of SDL/MSC based method TIMe (The Integrated Method) and the textbook "Systems Engineering using SDL-92". He was one of the four designers of the BETA programming language; he is co-author of the book "Object Oriented Programming in the BETA Programming Language" as well as on a long list of papers on object oriented programming.

*Oystein Hauge*n is principal researcher at Ericsson NorARC and part-time associate professor at University of Oslo within the Precise Modeling and Analysis group. He has worked within standardization of SDL and MSC since 1989 and together with Birger Moller-Pedersen he initiated the introduction of object orientation into SDL. From 1993 he has worked with MSC and from 1997 - 2000 he was responsible for the Z.120 standard. He is co-author of SDL/MSC based method TIMe (The Integrated Method), and the textbook "Engineering Real Time Methods".

Thomas Weigert is Director of Technology and Standards with the Global Software Group of Motorola. He serves as Rapporteur for SDL with ITU-T and as co-chair of the UML 2.0 Working Group in the OMG. His research focus has been the application of mathematical techniques and formal reasoning to the development of product software. He is the author of the text book "Knowledge-Based Software Development for Real-Time Distributed Systems" as well as over thirty journal articles on the application of Artificial Intelligence techniques to the development of product software, in particular for real-time distributed systems. He received a Ph.D. in Philosophy from the University of Illinois and an MBA from Northwestern University.

Professional Development Seminar 3 – *Room Cypress*

Essential Software Measurement and Assessment Methodology: Technical and Legal Issues of Software Evaluation for Acceptance Testing and Certification

Hans-Ludwig Hausen, *German National Research Center for Information Technology (GMD), Germany*

Overview

The overall aim of the professional development seminar is to make the attendees familiar with the methods and principles of software measurement and assessment for procedural, object-oriented and agent-based systems. Attendees will exercise proven techniques for goal directed validation, verification, testing, measurement, scaling and assessment as part of an industry proven, standardized procedure for concurrent software quality assurance and final evaluation for certification. The set of quality issues addressed in the PDS comprise: performance, efficiency, reliability, functionality, usability, maintainability, integrity, privacy, safety, security, as well as quality of service. In addition to the technical topics, legal issues are discussed with respect to their interface to the technical process. Finally an overview will be provided discussing the national and international standards for software assessment and certification such as ISO14598, ISO12119, as well as the process standards SPICE, CMM, Euromethod, or VM.

The level of the PDS will be intermediate. Emphasis will be given to selected advanced topics depending on the requirements and needs of participants.

Audience

Attendees should be familiar with software quality assurance techniques, such as inspection, testing, verification or validation. A basic knowledge in math and some knowledge on software methods and tools might be helpful for a participant to actively participate in the Professional Development Seminar. Software designers, managers and quality assurance staff and managers will benefit most from the PDS.

About the Presenter

Position: Principal Scientist (Senior Researcher, Project Manager), German National Research Center for Information Technology (GMD), Germany

Experience: 17 years as project manager, consultant, advisor and lecturer on
- computer aided software engineering
- software quality assurance
- software process modeling and tailoring

on more than 10 large software engineering projects for governments and industry.

Publications: About 60 papers and 3 books on
- software engineering environments
- software quality and productivity
- information storage and retrieval

Further details on *http://www.scope.gmd.de*

COMPSAC 2002

Oxford, England, August 26–30, 2002

CALL FOR CONTRIBUTIONS

The major theme for the 26th conference will be:

Prolonging Software Life: Development and Redevelopment

Methodology topics include, but not limited to, the following:

Software Architecture, Framework, and Design Patterns; Requirements Engineering; Object-Oriented Technology; Component-Based Software Development; Professional Development; Software Reengineering; Process Management; Product-Line Management; Quality Management; Software Reuse; Safety and Security; Software Reliability; Software Testing, Metrics, and Measurement

Application topics include, but not limited to, the following:

Electronic Commerce; Ubiquitous / Pervasive Computing

Systems topics include, but not limited to, the following:

Collaborative Systems; Distributed Systems; Embedded Systems; Enterprise Systems; Internet and Web-Based Systems; Middleware Systems; Mobile Systems; Multimedia Systems

INFORMATION FOR AUTHORS OF REGULAR PAPERS

Submit original (not published or submitted elsewhere) papers of 3000-5000 words. Include the title of the paper, the name and affiliation of each author, a 150-word abstract, and up to 8 keywords. Include also the name, address, telephone and fax numbers, and e-mail address of the author responsible for correspondence of the paper.

INFORMATION FOR AUTHORS OF INDUSTRIAL ABSTRACTS

The objective of industrial abstracts is to report on-going work, describe practical experiences, introduce new ideas to provoke further validation, or state positions on controversial issues. Authors will have a 6-minute presentation and a 4-minute discussion at the conference. Accepted abstracts will be published in the conference proceedings. Submit a 3-page abstract, including the title, authors' names, affiliations, addresses, telephone and fax numbers, and e-mail addresses.

INFORMATION FOR WORKSHOP ORGANIZERS

Half- and full-day participative workshops workshops will enable leading-edge issues to be explored in depth. Every participant will be expected to submit either a short position paper or a list of "burning issues". Organizers should submit workshop proposals, including the title, workshop rationale, goals, how participants will be solicited and position papers handled, workshop activities, expected workshop output, plans for publication, organizer's contact information, and past experience of operating workshops.

INFORMATION FOR PANEL ORGANIZERS

Panel sessions on important topics will be held in parallel with the paper sessions. Organizers should submit panel proposals, including the title, a 150-word scope statement, proposed chair and participants, their affiliations, and the organizer's contact details.

SUBMISSIONS

Submit to:

Hongji Yang, Program Chair
Department of Computer Science
De Montfort University
Leicester, LE1 9BH, England

e-mail: compsac2002@dmu.ac.uk
telephone: +44 (0)116-250-6398
fax: +44 (0)116-250-6399

The deadline for submissions is **January 25, 2002**.

FURTHER INFORMATION

For more information regarding the conference and related activities, visit the COMPSAC 2002 web site: *http://www.cse.dmu.ac.uk/COMPSAC*

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