Table of Contents / Table des matières

Authors/Auteurs ........................................................................................................... xx

Introduction/Introduction
CAS Project Participants ............................................................................................ 1

Software Architecture/Architecture logicielle
An Integrated Architecture for Distributed Applications ............................................. 8
M.A. Bauer, N. Coburn, D.L. Erickson, P.J. Finnigan, J.W. Hong, P-Å. Larson and J. Slonim
An Integrated Distributed Systems Management Architecture .................................. 27
M.A. Bauer, P.J. Finnigan, J.W. Hong, J. Pachl and T.J. Teorey
Business-Structured Client/Server: An Architecture for Distributed Applications ....... 41
Dominic R. Cols
Isochronets: An Architecture for High-Speed Networks .............................................. 54
Danilo Florissi and Yechiam Yemini
A Multimedia Real-time Conferencing System: Architecture and Implementation ...... 64
L. Lamont, G. Henderson and N.D. Georganas

Software Integration/Intégration de logiciels
Experimental Use of the Portable Common Tool Environment (PCTE) on a Fine-Grained Data Problem .................................................................................................................... 73
Michael Caldwell, David Carney and Fred Long
ADVcharts: A Graphical Specification for Abstract Data Views ............................... 84
L.M.F. Carneiro, D.D. Cowan and C.J.P. Lucena
An Example of Linking Formal Methods with CASE Tools (A Model Checker for Statecharts) . 97
Nancy Day
Formal Approach to QoS Specification and Verification ............................................ 108
J. de Meer, A. Rennoch and J. Burmeister
Visual Formalisms for Configuration Management ................................................... 120
Michael W. Godfrey
Integration of CASE into Undergraduate Education .................................................. 128
Jeffrey J. Joyce

Software Evolution/Évolution des logiciels
MAINTENANCE PRODUCTIVITY: Observations Based on an Experience in a Large System Environment ................................................................. 138
Carl S. Hartzman and Charles F. Austin
Identifying Redundancy in Source Code using Fingerprints ...................................... 171
J. Howard Johnson
Formal Specifications Design, Evolution and Reuse .................................................. 184
Perhat Khendek and Gregor v. Bochmann
Program Representation and Behavioural Matching For Localizing Similar Code Fragments .. 194
Kostas Kontogiannis
The Development of a Partial Design Recovery Environment for Legacy Systems ...... 206
K. Kontogiannis, M. Bernstein, E. Merlo and R. DeMori

xxv
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding Software Systems Using Reverse Engineering Technology Perspectives from the Rigi Project</td>
<td>217</td>
</tr>
<tr>
<td>Hausti A. Müller, Scott R. Tilley and Kenny Wong</td>
<td></td>
</tr>
<tr>
<td>Generating Programming Language-based Pattern Matchers</td>
<td>227</td>
</tr>
<tr>
<td>Santanu Paul and Atul Prakash</td>
<td></td>
</tr>
<tr>
<td>Managing Views in a Program Understanding Tool</td>
<td>244</td>
</tr>
<tr>
<td>Kenny Wong</td>
<td></td>
</tr>
<tr>
<td><strong>Software Development Processes/Procédés de développement de logiciels</strong></td>
<td></td>
</tr>
<tr>
<td>The Impact of Inserting a Tool into a Software Process</td>
<td>250</td>
</tr>
<tr>
<td>Tilmann Bruckhaus</td>
<td></td>
</tr>
<tr>
<td>An Empirical Evaluation of the G/Q/M Method</td>
<td>265</td>
</tr>
<tr>
<td>Khaled El Emam, Nadir Moukheiber and Nazim H. Madhavji</td>
<td></td>
</tr>
<tr>
<td>Evaluating the Impact of Process Improvements Quantitatively using Process Modeling</td>
<td>290</td>
</tr>
<tr>
<td>David Raffo</td>
<td></td>
</tr>
<tr>
<td>OPT: Organization and Process Together</td>
<td>314</td>
</tr>
<tr>
<td>Carolyn B. Seaman</td>
<td></td>
</tr>
<tr>
<td>A Proposed Approach to Process Decomposition and Collaboration for Marvel</td>
<td>325</td>
</tr>
<tr>
<td>Andrew Z. Tong</td>
<td></td>
</tr>
<tr>
<td>Surveys as a Method for Improving the Development Process</td>
<td>337</td>
</tr>
<tr>
<td>Joe Wigglesworth</td>
<td></td>
</tr>
<tr>
<td>Linkage Metrics for Process Reengineering</td>
<td>356</td>
</tr>
<tr>
<td>Alan T. Yaung and Tzvi Raz</td>
<td></td>
</tr>
<tr>
<td><strong>Quality Engineering/Contrôle de la qualité</strong></td>
<td></td>
</tr>
<tr>
<td>How One Product Team Met the Quality Challenge</td>
<td>371</td>
</tr>
<tr>
<td>Mark Changfoot, Ted Fines, Rod Lawson, Nick Lecic, Pat Morenz, Doug Mortson, Pramod Patel, Shelagh Roberts, Sheik Sahib and Rollie Sing</td>
<td></td>
</tr>
<tr>
<td>Cost, Quality and User Satisfaction of Software Products: An Empirical Analysis</td>
<td>400</td>
</tr>
<tr>
<td>M.S. Krishnan</td>
<td></td>
</tr>
<tr>
<td>Illuminating Software Specifications</td>
<td>412</td>
</tr>
<tr>
<td>Arthur Ryman</td>
<td></td>
</tr>
<tr>
<td>Filtering for Quality</td>
<td>429</td>
</tr>
<tr>
<td>Joel Troster, John Henshaw and Erich Buss</td>
<td></td>
</tr>
<tr>
<td><strong>Testing and Debugging/Essai et déverminage</strong></td>
<td></td>
</tr>
<tr>
<td>Using Hy+ for Network Management and Distributed Debugging</td>
<td>450</td>
</tr>
<tr>
<td>Mariano P. Consens, Masum Z. Hasan and Alberto O. Mendelzon</td>
<td></td>
</tr>
<tr>
<td>A Case Study In Class Testing</td>
<td>472</td>
</tr>
<tr>
<td>Daniel Hoffman and Paul Strooper</td>
<td></td>
</tr>
<tr>
<td>Collecting Data for Software Reliability Analysis and Modeling</td>
<td>483</td>
</tr>
<tr>
<td>Joe Palma, Jeff Tian and Peng Lu</td>
<td></td>
</tr>
<tr>
<td>Fault-Based Test Generation for Cause-Effect Graphs</td>
<td>495</td>
</tr>
<tr>
<td>Kuo-Chung Tai, Amit Paradkar, Hsun-Kang Su and Mladen A. Vouk</td>
<td></td>
</tr>
<tr>
<td>The Use of Process Clustering in Distributed-System Event Displays</td>
<td>505</td>
</tr>
<tr>
<td>David J. Taylor</td>
<td></td>
</tr>
</tbody>
</table>
Some Issues in Multi-Phase Software Reliability Modeling ........................................ 513
M.A. Vouk and K.C. Tai

Efficient Event Generation for Detecting Races ...................................................... 524
Scotte Zinn and Michael Coffin

Object-Oriented Technology/Technologie orientée objet

Using Objects to Distribute Configuration Management Tasks ................................ 537
Terry Coatta

Developing an Object-Oriented View Management System ........................................ 548
Harumi A. Kuno and Elke A. Rundensteiner

Towards Unifying Analysis, Design, and Implementation in Object-Oriented Environments .. 563
Wilf LaLonde, John Pugh, Paul White and Jean-Pierre Corriveau

Using SOM for Tool Integration ........................................................................... 570
Christina Lau

A Multi-Dimensional Taxonomy of Software Development Environments ................ 581
Spiros Mancoridis

TIGUKAT Object Management System: Initial Design and Current Directions .............. 595
M. Tamer, Özsu, Randal Peters, Boman Irani, Anna Lipka, Adriana Munoz and Duane Szafron

Visualizing Object Oriented Software in Three Dimensions .................................. 612
Colin Ware, David Hui and Glenn Franck

Challenges in Distributed Systems/Systèmes répartis : les difficultés

Operation Jump Start: A CORDS Integration Prototype using DCE .......................... 621
Gopi K. Attaluri, Dexter Bradshaw, Patrick J. Finnigan, Nigel Hinds, Michael Kalantar,
Kelly A. Lyons, Andrew D. Marshall, Jan Pachl and Hong Tran

On Distributed System Management .................................................................. 637
German Goldszmidt

Knowledge-Based Security Administration in a Distributed Environment ................. 648
Christoph Lingenfelder and Sven Lorenz

Exploring Large Hyperdocuments: Fisheye Views of Nested Networks .................. 661
Emanuel G. Noik

Modeling RPC Performance .............................................................. 677
J.A. Rolia, M. Starkey and G. Boersma

Managing Heterogeneous Distributed Computing Systems: Using Information Repositories ... 691
Gerald A. Winters and Toby J. Teorey

Information Services/Services d'information

Interface Design Issues in the MEDIALOG Project ............................................. 707
Claude Chapdelaine, Raymond Descout and Pierre Billon

A Document Model for Multimedia Information ............................................. 715
J. Emery and A. Karmouch

Implementing a Delegation Model Design of an HPCC Application Using Concert/C .... 729
Patricia Gomes Soares and Alan Randolph Karben

Distributed Information Discovery Challenges ........................................... 739
Nigel Hinds

Multimedia Integration in the RACE BANK Multimedia Broadband Cooperation Project .... 746
Norbert Luttenberger
COOPDRAW: A Multiagent Architecture for a Shared Graphical Editor .......................... 758
Christophe Ramstein

Multidatabase Systems/Systèmes comportant plusieurs bases de données
CORDS Multidatabase Project: Research and Prototype Overview ................................. 767
Neil Coburn, Per-Åke Larson, T. Patrick Martin and Jacob Slonim
Database Integration using Multidatabase Views .............................................................. 779
Patrick Martin and Wendy Powley
Engineering an SQL Gateway to IMS ................................................................. 789
G.N. Paulley
Exploiting Uniqueness in Query Optimization ...................................................... 804
G.N. Paulley and Per-Åke Larson
Interchanging Group-by and Join in Distributed Query Processing ......................... 823
Weipeng Paul Yan
An Integrated Method for Estimating Selectivities in a Multidatabase System .............. 832
Qiang Zhu
Query Optimization Using Fuzzy Set Theory for Multidatabase Systems .................. 848
Qiang Zhu and Per-Åke Larson

Distributed Transaction Management/Système réparti de gestion de transactions
Logical Concurrency Control for Large Objects in a Multidatabase System .................. 860
Gopi K. Attaluri
Architecture for Transaction Management in the CORDS Multidatabase Service .......... 873
Gopi Attaluri and Dexter P. Bradshaw
Weakly Consistent Transactions in ROSS .............................................................. 888
Barry Brachman and Gerald Neufeld
Composite Multidatabase System Concurrency Control and Recovery ......................... 895
Dexter P. Bradshaw
A Transaction Manager Component for Cooperative Transaction Models .................. 910
George T. Heineman

Compiler Technology for Parallel Machines/Technologie des compilateurs pour machines parallèles
Concurrency Abstractions in a C++ Class Library .................................................... 919
Eshrat Arjomandi, Ivan Kalas and William O'Farrell
Language Support for Data Parallelism in Pointer Based Dynamic Data Structures ........ 933
Pankaj Kumar
Register Allocation for Optimal Loop Scheduling ................................................... 942
Qi Ning
Evaluation of Distributed Communication Systems ............................................... 956
Ian Parsons
Consistency and Event Ordering in the Shared Regions Model .................................. 971
Harjinder S. Sandhu
Deductive Database Support for Data Visualization .............................................. 985
Dimitra Vista
Enterprise in Context: Assessing the Usability of Parallel Programming Environments ... 999
Gregory V. Wilson, Jonathan Schaeffer and Duane Szafron

xviii
Documentation/Documentation

Information Visualization and Interactive Querying for Online Documentation and Electronic Books ................................................................. 1011
  Mark H. Chignell, Gene Golovchinsky, Ferdie Poblete and Sarah Zuberec

Documents, Concepts and Neural Networks ........................................ 1021
  Jennifer Farkas

Determining Core Competences in the Information Development Environment: An Example . 1032
  Anna M. Giardino and Stephen G. Pearce

Validating a Core Competence: Information Development ...................... 1041
  Kathleen Dowling and Melanie Stockham

A Comparison of Interobserver Agreement and Quantity of Usability Data Obtained Using Graphics-Based and Text-Based Data Collection Tools ................................................................. 1053
  Frances L. Palacio, Douglas R. Bloch and Carol Right

Writing about C++ ............................................................................. 1059
  Mark Ryan

Using Cognates to Align Sentences in Bilingual Corpora ........................ 1071
  Michel Simard, George F. Foster and Pierre Isabelle

Documenting-in-the-large vs. Documenting-in-the-small ....................... 1083
  Scott R. Tilley

Potpourri/Pot-pourri

Colour Monitor Calibration Based on CIE Standards ................................ 1091
  Radu I. Campeanu and John D. McFall

A Simple Model of Prolog’s Performance — Extensional Predicates ........... 1119
  Carlos Escalante

Translation Analysis and Translation Automation ..................................... 1133
  Pierre Isabelle, Marc Dymetman, George Foster, Jean-Marc Jutras, Elliott Macklovitch,
  François Perrault, Xiaobo Ren and Michel Simard

Properties of the Voronoi Diagram Cluster Buster ................................ 1148
  Kelly A. Lyons, Henk Meijer and David Rappaport

Managing and Reproducing Colour Images (MARCI) ............................. 1164
  John D. McFall