

Lecture Notes in Computer Science

Edited by G. Goos, J. Hartmanis and J. van Leeuwen

1944

Springer

Berlin

Heidelberg

New York

Barcelona

Hong Kong

London

Milan

Paris

Singapore

Tokyo

Klaus R. Dittrich Giovanna Guerrini
Isabella Merlo Marta Oliva
M. Elena Rodríguez (Eds.)

Objects and Databases

International Symposium
Sophia Antipolis, France, June 13, 2000
Revised Papers



Springer

Volume Editors

Klaus R. Dittrich
University of Zurich, Department of Computer Science
Winterthurerstrasse 190, 8057 Zurich, Switzerland
E-mail: dittrich@ifi.unizh.ch

Giovanna Guerrini
Isabella Merlo
Università di Genova, Dipartimento di Informatica e Scienze dell'Informazione
via Dodecaneso 35, 16146 Genova, Italy
E-mail: {guerrini/merloisa}@disi.unige.it

Marta Oliva
Universitat de Lleida, Departament d'Informàtica i Enginyeria Industrial
C. Jaume II, 69, 25001 Lleida, Spain
E-mail: oliva@eup.udl.es

M. Elena Rodríguez
Universitat Politècnica de Catalunya
Departament de Llenguatges i Sistemes Informàtics
Mòdul C 6, C. Jordi Girona Salgado 1-3, 08034 Barcelona, Spain
E-mail: malena@lsi.upc.es

Cataloging-in-Publication Data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Objects and databases : international symposium, Sophia Antipolis,
France, June 13, 2000 ; revised papers / Klaus R. Dittrich ... (ed.).
- Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ;
Milan ; Paris ; Singapore ; Tokyo : Springer, 2001
(Lecture notes in computer science ; Vol. 1944)
ISBN 3-540-41664-1

CR Subject Classification (1998): H.2.4, H.2, D.1.5, D.3

ISSN 0302-9743

ISBN 3-540-41664-1 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

Springer-Verlag Berlin Heidelberg New York
a member of BertelsmannSpringer Science+Business Media GmbH
© Springer-Verlag Berlin Heidelberg 2001
Printed in Germany

Typesetting: Camera-ready by author, data conversion by PTP-Berlin, Stefan Sossna
Printed on acid-free paper SPIN: 10781349 06/3142 5 4 3 2 1 0

Preface

These post-proceedings contain the revised versions of the papers presented at the “Symposium on Objects and Databases” which was held in Sophia-Antipolis, France, June 13, 2000, in conjunction with the Fourteenth European Conference on Object-Oriented Programming, ECOOP 2000. This event continued the tradition established the year before in Lisbon (Portugal) with the First Workshop on Object-Oriented Databases.

The goal of the symposium was to bring together researchers working in various corners of the field of objects and databases, to discuss the current state of research in the field and to critically evaluate existing solutions in terms of their current usage, their successes and limitations, and their potential for new applications.

The organizing committee received 21 papers which were reviewed by a program committee of people active in the field of objects and databases. There were 3 reviews for each paper, and finally the organizing committee selected 9 long papers, 2 short papers, and a demonstration to be presented and discussed at the symposium. The selected papers cover a wide spectrum of topics, including data modeling concepts, persistent object languages, consistency and integrity of persistent data, storage structures, class versioning and schema evolution, query languages, and temporal object-oriented databases.

In addition to the regular papers, the symposium included an invited presentation, given by Prof. Malcolm Atkinson from the University of Glasgow (Scotland) where he heads the Persistence and Distribution Group.

We wish to express our gratitude to all those individuals and institutions who made this symposium and the proceedings possible: to the authors of papers; to the members of the program committee and the external reviewers for carefully reviewing the papers; to Malcolm Atkinson for accepting our invitation to give a talk and to prepare a paper for this volume; and to the publisher for the pleasant co-operation. In addition we wish to thank the Organizing Chairs of ECOOP 2000, Denis Caromel and Jean-Paul Rigault for the economic support for inviting Malcolm Atkinson, and the workshop chairs of ECOOP 2000, Sabine Moisan and Jacques Malenfant, for their efforts in scheduling and local arrangements. Finally, we thank all the participants, without whom the symposium would not have been possible.

January 2001

Klaus R. Dittrich
Giovanna Guerrini
Isabella Merlo
Marta Oliva
M. Elena Rodríguez

Program Committee

Suad Alagić	Wichita State University, USA
Akmal Chaudhri	Computer Associates Plc, UK
Christine Collet	INPG-Ensimag Grenoble, France
Philippe Collet	University of Nice Sophia Antipolis, France
Óscar Díaz	University of Basque Country, Spain
Leonidas Fegaras	University of Texas at Arlington, USA
Elena Ferrari	University of Milano, Italy
Jesús García Molina	University of Murcia, Spain
Giorgio Ghelli	University of Pisa, Italy
Antony Hosking	Purdue University, USA
Gerti Kappel	Johannes Kepler University of Linz, Austria
Alfons Kemper	University of Passau, Germany
Paloma Martínez	University Carlos III of Madrid, Spain
Bernd Mathiske	Sun Microsystems Laboratories, USA
Adoración de Miguel	University Carlos III of Madrid, Spain
Moirá Norrie	ETH Zürich, Switzerland
Tamer Özsu	University of Alberta, Canada
Tony Printezis	University of Glasgow, UK
Awais Rashid	Lancaster University, UK
Tore Risch	Uppsala University, Sweden
Elke Rundensteiner	Worcester Polytechnic Institute, USA
Gunter Saake	Otto-von-Guericke University of Magdeburg, Germany
Markku Sakkinen	Tampere University of Technology, Finland
José Samos	University of Granada, Spain
Roberto Zcari	Johann Wolfgang Goethe-University, Frankfurt/Main, Germany

Additional Referees

Edgard Benítez-Guerrero	Iqbal Goralwalla
Kajal Claypool	Svetlana Kouznetsova
Stephan Dassow	Genoveva Vargas-Solar

Organizing Committee

Klaus R. Dittrich	University of Zürich, Switzerland
Giovanna Guerrini	University of Genova, Italy
Isabella Merlo	University of Genova, Italy
Marta Oliva	University of Lleida, Spain
M. Elena Rodríguez	Technical University of Catalonia, Spain

Table of Contents

Invited Talk

Persistence and Java — A Balancing Act	1
<i>Malcolm Atkinson (University of Glasgow, UK)</i>	

Persistence

Parametric Polymorphism and Orthogonal Persistence	32
<i>Suad Alagić, Tuong Nguyen (Wichita State University, USA)</i>	
Towards a Consistent Viewpoint on Consistency for Persistent Applications	47
<i>Philippe Collet, Greta Vignola (University of Nice, France)</i>	
Towards Scalable and Recoverable Object Evolution for the PJama Persistent Platform	61
<i>Misha Dmitriev, Craig Hamilton (University of Glasgow, UK)</i>	

Clustering

Dynamic Clustering in Object-Oriented Databases: An Advocacy for Simplicity	71
<i>Jerome Darmont (University of Lyon 2, France), Christophe Fromantin (University Blaise Pascal, France), Stephane Régnier, Le Gruenwald (University of Oklahoma, USA), Michel Schneider (University Blaise Pascal, France)</i>	
Opportunistic Prioritised Clustering Framework (OPCF)	86
<i>Zhen He, Alonso Márquez (Australian National University, Australia), Stephen Blackburn (University of Massachusetts, USA)</i>	

Schema Evolution

A Flexible Approach for Instance Adaptation During Class Versioning	101
<i>Awais Rashid, Peter Sawyer (Lancaster University, UK), Elke Pulvermüller (University of Karlsruhe, Germany)</i>	
Optimizing Performance of Schema Evolution Sequences	114
<i>Kajal T. Claypool, Chandrakant Natarajan, Elke A. Rundensteiner (Worcester Polytechnic Institute, USA)</i>	

Data Mining and Data Warehouse

ODMQL: Object Data Mining Query Language	128
<i>Mohamed G. Elfeky (Purdue University, USA),</i>	
<i>Amani A. Saad, Souheir A. Fouad (Alexandria University, Egypt)</i>	

Benefits of an Object-Oriented Multidimensional Data Model	141
<i>Alberto Abelló (Technical University of Catalonia, Spain),</i>	
<i>José Samos (University of Granada, Spain),</i>	
<i>Fèlix Saltor (Technical University of Catalonia, Spain)</i>	

Miscellaneous

The NODS Project: Networked Open Database Services	153
<i>Christine Collet (LSR-IMAG, University of Grenoble, France)</i>	

Pointwise Temporal Object Database Browsing	170
<i>Marlon Dumas, Chaouki Daassi, Marie-Christine Fauvet,</i>	
<i>Laurence Nigay (University of Grenoble, France)</i>	

Towards a Unified Query-by-Example (UQBE): UML as a Basis for a Generic Graphical Query Language	185
<i>Miguel Angel Sicilia Urbán (University of Carlos III, Madrid, Spain),</i>	
<i>Elena García Barriocanal (University of Alcalá de Henares,</i>	
<i>Madrid, Spain), Juan M. Doderó Beardo (University of Carlos III,</i>	
<i>Madrid, Spain)</i>	

Pannel Discussion

Concluding Remarks	197
<i>Klaus R. Dittrich (University of Zurich, Switzerland),</i>	
<i>Giovanna Guerrini, Isabella Merlo (University of Genova, Italy),</i>	
<i>Marta Oliva (University of Lleida, Spain),</i>	
<i>M. Elena Rodríguez (Technical University of Catalonia, Spain)</i>	

Author Index	199
---------------------------	------------