

Springer

Berlin

Heidelberg

New York

Barcelona

Hong Kong

London

Milan

Paris

Singapore

Tokyo

Ron Y. Pinter Shalom Tsur (Eds.)

Next Generation Information Technologies and Systems

4th International Workshop, NGITS'99
Zikhron-Yaakov, Israel, July 5-7, 1999
Proceedings



Springer

Series Editors

Gerhard Goos, Karlsruhe University, Germany
Juris Hartmanis, Cornell University, NY, USA
Jan van Leeuwen, Utrecht University, The Netherlands

Volume Editors

Ron Y. Pinter
IBM Research Laboratory in Haifa
Matam – Advanced Technology Center
Haifa 31905, Israel
E-mail: pinter@il.ibm.com

Shalom Tsur
SurroMed, Inc.
1060 East Meadow Circle
Palo Alto, CA 94303, USA
E-mail: tsur@surromed.com

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Next generation information technologies and systems : 4th
international workshop ; proceedings / NGITS '99, Zikhron-Yaakov,
Israel, July 5 - 7, 1999. Ron Pinter ; Shalom Tsur (ed.). - Berlin ;
Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ;
Paris ; Singapore ; Tokyo : Springer, 1999
(Lecture notes in computer science ; Vol. 1649)
ISBN 3-540-66225-1

CR Subject Classification (1998): H.2, H.3, H.4, H.5, C.2

ISSN 0302-9743

ISBN 3-540-66225-1 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 1999
Printed in Germany

Typesetting: Camera-ready by author
SPIN 10703935 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Foreword

The Next Generation Information Technologies and Systems (NGITS) workshop series is a biannual event held in Israel since 1993. Like its predecessors, NGITS'99 brings together active members of the international research community interested in information technology and knowledge based systems. Many of the base technologies in the traditional areas of database management systems, information retrieval, and resource optimization, are being deployed nowadays in novel systems and applications that flourish with the astonishing increase in computational power, storage capacity, communication, and - of course - the advent of the world-wide web. These new fronts, in turn, present an ever growing set of challenges to the technologies, such as data availability, information integrity, and knowledge extraction, fuelling an exciting set of activities.

Our workshop clearly reflects this trend, offering a rich sample of the state of the art at the close of the millennium and a glimpse of what is to come in the next one. In response to the call for papers, we received 34 high quality submissions, 22 of which were carefully selected by the Program Committee for presentation at the workshop and inclusion in these proceedings. These include 17 full length papers as well as 5 short papers (that will be accompanied by demonstrations during the workshop). In addition, it is our pleasure to feature two invited talks, given by Professor J. Ullman of Stanford University and IBM Fellow C. Mohan.

We classified the selected papers into a number of broad topics, which were also used to organize the workshop sessions:

- Exploring the World Wide Web
- Database Technology
- Storage, Meta Information, Ontologies, and Software Engineering
- Agent and Workflow Management Technology
- Data Warehousing and Mining

We would like to extend our thanks to the many individuals who spared no time or effort to contribute to the success of this event:

The authors, the Program Committee members, and the technical reviewers, Tova Berger, Antje Endemann, Dagan Gilat, Danna Pascal, and Nilly Schnapp for their support in organization and logistics.

Finally, we would like to recognize the NGITS'99 institutional sponsors (listed in alphabetic order) and would like to thank them for their generous support:

The IBM Research Lab in Haifa,
The Tandem Labs Israel, a Compaq Company,
The Technion, Israel Institute of Technology, Haifa, Israel.

Haifa, Israel
May 1999

Ron Pinter, Shalom Tsur
Program Co-chairs

Opher Etzion
General Chair

Series Editors

Gerhard Goos, Karlsruhe University, Germany
Juris Hartmanis, Cornell University, NY, USA
Jan van Leeuwen, Utrecht University, The Netherlands

Volume Editors

Ron Y. Pinter
IBM Research Laboratory in Haifa
Matam – Advanced Technology Center
Haifa 31905, Israel
E-mail: pinter@il.ibm.com

Shalom Tsur
SurroMed, Inc.
1060 East Meadow Circle
Palo Alto, CA 94303, USA
E-mail: tsur@surromed.com

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Next generation information technologies and systems : 4th
international workshop ; proceedings / NGITS '99, Zikhron-Yaakov,
Israel, July 5 - 7, 1999. Ron Pinter ; Shalom Tsur (ed.). - Berlin ;
Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ;
Paris ; Singapore ; Tokyo : Springer, 1999
(Lecture notes in computer science ; Vol. 1649)
ISBN 3-540-66225-1

CR Subject Classification (1998): H.2, H.3, H.4, H.5, C.2

ISSN 0302-9743

ISBN 3-540-66225-1 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 1999
Printed in Germany

Typesetting: Camera-ready by author
SPIN 10703935 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Table of Contents

Invited Talk I

| | |
|---|---|
| Some Advances in Data-Mining Techniques Jeffrey D. Ullman..... | 1 |
|---|---|

Web Exploration

| | |
|--|---|
| Querying Semantically Tagged Documents on the World-WideWeb Ziv Bar-Yossef, Yaron Kanza, Yakov Kogan, Werner Nutt, Yehoshua Sagiv..... | 2 |
|--|---|

| | |
|--|----|
| WWW Exploration Queries David Konopnicki, Oded Shmueli..... | 20 |
|--|----|

| | |
|--|----|
| Strategies for Filtering E-mail Messages Combining Content-Based and Sociological Filtering with User-Stereotypes Peretz Shoval, Bracha Shapira, Uri Hanani..... | 40 |
|--|----|

| | |
|--|----|
| Interactive Query Expansion in a Meta-search Engine Claudia Oliveira, Luis Gustavo Varges Resende, Roberto Lehmann..... | 50 |
|--|----|

Database Technology

| | |
|--|----|
| On the Optimization of Queries Containing Regular Path Expressions Andreas Henrich, Stefan Jamin..... | 58 |
|--|----|

| | |
|--|----|
| A Database Array Algebra for Spatio-Temporal Data and Beyond Peter Baumann..... | 76 |
|--|----|

| | |
|--|----|
| Dynamic Relationships and Their Propagation and Concurrency Semantics in Object-Oriented Databases Amir Sapir, Ehud Gudes..... | 94 |
|--|----|

| | |
|---|-----|
| Tracking Moving Objects Using Database Technology in DOMINO Ouri Wolfson, Prasad Sistla, Bo Xu, Jutai Zhou, Sam Chamberlain, Yelena Yesha, Naphtali Rishe | 112 |
|---|-----|

| | |
|--|-----|
| OLOG: A Deductive Object Database Language Mengchi Liu..... | 120 |
|--|-----|

| | |
|--|-----|
| Multiplex: A Formal Model for Multidatabases and Its Implementation Amihai Motro..... | 138 |
|--|-----|

| | |
|---|-----|
| Temporal Active Rules Mati Golani, Opher Etzion..... | 159 |
|---|-----|

Storage, Meta Information, Ontologies, and Software Engineering

| | |
|---|-----|
| Cost-Effective Jukebox Storage via Hybrid File-Block Caching Yitzhak Birk, Mark Mokryn..... | 173 |
| Ontology-Driven Integration of Scientific Repositories Vassilis Christophides, Catherine Houstis, Spyros Lalis, Hariklia Tsalapata..... | 190 |
| Global Version Management for a Federated Turbine Design Environment Martin Schönhoff, Markus Strässler..... | 203 |
| From Object-Process Diagrams to a Natural Object-Process Language Mor Peleg, Dov Dori..... | 221 |
| e-Colabra: An Enterprise Collaboration & Reuse Environment Orit Edelstein, Avi Yaeli, Gabi Zodik..... | 229 |

Invited Talk II

| | |
|--|-----|
| Workflow Management in the Internet Age C. Mohan | 237 |
|--|-----|

Agent and Workflow Management Technology

| | |
|--|-----|
| A Component-Based Workflow System with Dynamic Modifications Pinar Koksall, Ibrahim Cingil, Asuman Dogac..... | 238 |
| A Temporal Reasoning Approach to Model Workflow Activities Nihan Kesim Cicekli..... | 256 |
| Dynamic Configuration and Enforcement of Access Control for Mobile Components Yoad Gidron, Israel Ben-Shaul, Yariv Aridor..... | 267 |

Data Warehousing and Mining

| | |
|---|-----|
| The MyVIEW Project: A Data Warehousing Approach to Personalized Digital Libraries Jens E. Wolff, Armin B. Cremers..... | 277 |
| Integrating Data Mining with Relational DBMS: A Tightly-Coupled Approach Svetlozar Nestorov, Shalom Tsur..... | 295 |
| Morphological Disambiguation for Hebrew Search Systems David Carmel, Yoëlle S. Maarek..... | 312 |
| Author Index..... | 327 |