Lecture Notes in Computer Science

4518

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Norbert Fuhr Mounia Lalmas Andrew Trotman (Eds.)

Comparative Evaluation of XML Information Retrieval Systems

5th International Workshop of the Initiative for the Evaluation of XML Retrieval, INEX 2006 Dagstuhl Castle, Germany, December 17-20, 2006 Revised and Selected Papers



Volume Editors

Norbert Fuhr
Department of Informatics
University of Duisburg-Essen, 47048 Duisburg, Germany
E-mail: norbert.fuhr@uni-due.de

Mounia Lalmas
Department of Computer Science
Queen Mary, University of London, London, UK
E-mail: mounia@dcs.gmul.ac.uk

Andrew Trotman
Department of Computer Science
University of Otago
Dunedin, New Zealand
E-mail: andrew@cs.otago.ac.nz

Library of Congress Control Number: 2007932681

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

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI $\,$

ISSN 0302-9743

ISBN-10 3-540-73887-8 Springer Berlin Heidelberg New York ISBN-13 978-3-540-73887-9 Springer 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. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2007 Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India Printed on acid-free paper SPIN: 12098521 06/3180 5 4 3 2 1 0

Preface

Welcome to the fifth workshop of the Initiative for the Evaluation of XML Retrieval (INEX)!

Now in its fifth year, INEX is an established evaluation forum for XML information retrieval (IR), with over 80 participating organizations worldwide. Its aim is to provide an infrastructure, in the form of a large XML test collection and appropriate scoring methods, for the evaluation of XML IR systems.

XML IR plays an increasingly important role in many information access systems (e.g., digital libraries, Web, intranet) where content is more and more a mixture of text, multimedia, and metadata, formatted according to the adopted W3C standard for information repositories, the so-called eXtensible Markup Language (XML). The ultimate goal of such systems is to provide the right content to their end-users. However, while many of today's information access systems still treat documents as single large (text) blocks, XML offers the opportunity to exploit the internal structure of documents in order to allow for more precise access, thus providing more specific answers to user requests. Providing effective access to XML-based content is therefore a key issue for the success of these systems.

In total, nine research tracks were included in INEX 2006, which studied different aspects of XML information access: Ad-hoc, Interactive, Use Case, Multimedia, Relevance Feedback, Heterogeneous, Document Mining, Natural Language Processing, and Entity Ranking. The Use Case and Entity Ranking tracks were new in 2006. The consolidation of the existing tracks, and the expansion to new areas offered by the two new tracks, allowed INEX to grow in reach.

The aim of the INEX 2006 workshop was to bring together researchers in the field of XML IR who participated in the INEX 2006 campaign. During the past year participating organizations contributed to the building of a large-scale XML test collection by creating topics, performing retrieval runs and providing relevance assessments. The workshop concluded the results of this large-scale effort, summarized and addressed the encountered issues and devised a work plan for the future evaluation of XML retrieval systems.

INEX was funded by the DELOS Network of Excellence on Digital Libraries, to which we are very thankful. We gratefully thank the organizers of the various tasks and tracks, who did a superb job. Finally, special thanks go to the participating organizations and individuals for their contributions.

March 2007

Norbert Fuhr Mounia Lalmas Andrew Trotman

Organization

Project Leaders

Norbert Fuhr University of Duisburg-Essen, Germany Mounia Lalmas Queen Mary, University of London, UK

Contact Persons

Saadia Malik University of Duisburg-Essen, Germany Zoltn Szlavik Queen Mary, University of London, UK

Wikipedia Document Collection

Ludovic Denoyer Universite Paris 6, France

Martin Theobald Max Planck Institute for Informatics, Germany

Use Case Studies

Andrew Trotman University of Otago, New Zealand Nils Pharo Oslo University College, Norway

Topic Format Specification

Andrew Trotman University of Otago, New Zealand Birger Larsen Royal School of LIS, Denmark

Task Description

Jaap Kamps University of Amsterdam, The Netherlands

Charles Clarke University of Waterloo, Canada

Online Relevance Assessment Tool

Benjamin Piwowarski Yahoo! Research Latin America, Chile

Metrics

Gabriella Kazai Microsoft Research Cambridge, UK Stephen Robertson Microsoft Research Cambridge, UK Paul Ogilvie Carnegie Mellon University , USA

Relevance Feedback Task

Yosi Mass IBM Research Lab, Israel

Ralf Schenkel Max Planck Institute for Informatics, Germany

Natural Query Language Task

Shlomo Geva Queensland University of Technology, Australia

Xavier Tannier XEROX, France

Heterogeneous Collection Track

Ingo Frommholz University of Duisburg-Essen, Germany Ray Larson University of California, Berkeley, USA

Interactive Track

Birger Larsen Royal School of LIS, Denmark

Anastasios Tombros Queen Mary, University of London, UK Saadia Malik University of Duisburg-Essen, Germany

Document Mining Track

Ludovic Denoyer Universite Paris 6, France
Anne-Marie Vercoustre Inria-Rocquencourt, France
Patrick Gallinari Universite Paris 6, France

XML Multimedia Track

Roelof van Zwol Yahoo! Research, Spain Thijs Westerveld CWI, The Netherlands

XML Entity Search Track

Arjen de Vries CWI, The Netherlands

Nick Craswell Microsoft Research Cambridge, UK

Table of Contents

${\bf Methodology}$

Overview of INEX 2006	1
The Wikipedia XML Corpus	12
INEX 2006 Evaluation Measures	20
Choosing an Ideal Recall-Base for the Evaluation of the Focused Task: Sensitivity Analysis of the XCG Evaluation Measures	35
Ad Hoc Track	
A Method of Preferential Unification of Plural Retrieved Elements for XML Retrieval Task	45
CISR at INEX 2006	57
Compact Representations in XML Retrieval	64
CSIRO's Participation in INEX 2006	73
Dynamic Element Retrieval in a Semi-structured Collection	82
Efficient, Effective and Flexible XML Retrieval Using Summaries	89
Evaluating Structured Information Retrieval and Multimedia Retrieval Using PF/Tijah	104

EXTIRP: Baseline Retrieval from Wikipedia	115
Filtering and Clustering XML Retrieval Results	121
GPX - Gardens Point XML IR at INEX 2006	137
IBM HRL at INEX 06	151
Indexing "Reading Paths" for a Structured Information Retrieval at INEX 2006	160
Influence Diagrams and Structured Retrieval: Garnata Implementing	105
the SID and CID Models at INEX'06	165
Information Theoretic Retrieval with Structured Queries and	450
Documents	178
SIRIUS XML IR System at INEX 2006: Approximate Matching of Structure and Textual Content	185
Structured Content-Only Information Retrieval Using Term Proximity and Propagation of Title Terms	200
Supervised and Semi-supervised Machine Learning Ranking	213
The University of Kaiserslautern at INEX 2006	223
TopX – AdHoc Track and Feedback Task	233
Tuning and Evolving Retrieval Engine by Training on Previous INEX Testbeds	243
Using Language Models and the HITS Algorithm for XML Retrieval Benny Kimelfeld, Eitan Kovacs, Yehoshua Sagiv, and Dan Yahav	253

Table of Contents	XI
Using Topic Shifts in XML Retrieval at INEX 2006	261
XSee: Structure Xposed	271
Natural Language Processing Track	
Shallow Parsing of INEX Queries	284
Using Rich Document Representation in XML Information Retrieval Fahimeh Raja, Mostafa Keikha, Masued Rahgozar, and Farhad Oroumchian	294
NLPX at INEX 2006	302
Heterogeneous Collection Track	
The Heterogeneous Collection Track at INEX 2006	312
Probabilistic Retrieval Approaches for Thorough and Heterogeneous XML Retrieval	318
Multimedia Track	
The INEX 2006 Multimedia Track	331
Fusing Visual and Textual Retrieval Techniques to Effectively Search Large Collections of Wikipedia Images	345
Social Media Retrieval Using Image Features and Structured Text D.N.F. Awang Iskandar, Jovan Pehcevski, James A. Thom, and S.M.M. Tahaghoghi	358
XFIRM at INEX 2006. Ad-Hoc, Relevance Feedback and MultiMedia Tracks Lobna Hlaoua, Mouna Torjmen, Karen Pinel-Sauvagnat, and Mohand Boughanem	373
Interactive Track	
The Interactive Track at INEX 2006	387

Use Case Track

XML-IR Users and Use Cases	400
A Taxonomy for XML Retrieval Use Cases	413
What XML-IR Users May Want	423
Document Track	
Report on the XML Mining Track at INEX 2005 and INEX 2006 Ludovic Denoyer, Patrick Gallinari, and Anne-Marie Vercoustre	432
Classifying XML Documents Based on Structure/Content Similarity Guangming Xing, Jinhua Guo, and Zhonghang Xia	444
Document Mining Using Graph Neural Network	458
Evaluating the Performance of XML Document Clustering by Structure Only	473
FAT-CAT: Frequent Attributes Tree Based Classification	485
Unsupervised Classification of Text-Centric XML Document Collections	497
XML Document Mining Using Contextual Self-organizing Maps for Structures	510
XML Document Transformation with Conditional Random Fields Rémi Gilleron, Florent Jousse, Isabelle Tellier, and Marc Tommasi	525
XML Structure Mapping	540
Author Index	553