## **Communications** in Computer and Information Science

701

Commenced Publication in 2007 Founding and Former Series Editors: Alfredo Cuzzocrea, Dominik Ślęzak, and Xiaokang Yang

#### **Editorial Board**

Simone Diniz Junqueira Barbosa

Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro. Brazil

Phoebe Chen

La Trobe University, Melbourne, Australia

Xiaoyong Du

Renmin University of China, Beijing, China

Joaquim Filipe

Polytechnic Institute of Setúbal, Setúbal, Portugal

Orhun Kara

TÜBİTAK BİLGEM and Middle East Technical University, Ankara, Turkey

Igor Kotenko

St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St. Petersburg, Russia

Ting Liu

Harbin Institute of Technology (HIT), Harbin, China

Krishna M. Sivalingam

Indian Institute of Technology Madras, Chennai, India

Takashi Washio

Osaka University, Osaka, Japan

More information about this series at http://www.springer.com/series/7899

Maristella Agosti · Marco Bertini Stefano Ferilli · Simone Marinai Nicola Orio (Eds.)

# Digital Libraries and Multimedia Archives

12th Italian Research Conference on Digital Libraries, IRCDL 2016 Florence, Italy, February 4–5, 2016 Revised Selected Papers



Editors
Maristella Agosti
Dipartimento di Ingegneria
dell'Informazione
Università degli Studi di Padova
Padua
Italy

Marco Bertini Dipartimento di Ingegneria dell'Informazione Università degli Studi di Firenze Florence Italy

Stefano Ferilli Dipartimento di Informatica Università degli Studi di Bari Bari Italy Simone Marinai
Dipartimento di Ingegneria
dell'Informazione
Università degli Studi di Firenze
Florence
Italy

Nicola Orio Dipartimento dei Beni Culturali Università degli Studi di Padova Padua Italy

ISSN 1865-0929 ISSN 1865-0937 (electronic)
Communications in Computer and Information Science
ISBN 978-3-319-56299-5 ISBN 978-3-319-56300-8 (eBook)
DOI 10.1007/978-3-319-56300-8

Library of Congress Control Number: 2017937300

#### © Springer International Publishing AG 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

#### **Preface**

Since 2005 the Italian Research Conference on Digital Libraries (IRCDL) has been providing a great opportunity for researchers in the field of digital libraries to present and discuss their current research activities and to envision together further developments. The IRCDL conferences were launched and initially sponsored by DELOS, an EU FP6 Network of Excellence on Digital Libraries, together with the Department of Information Engineering of the University of Padua. Over the years IRCDL has become a self-sustainable event that is supported by the Italian digital libraries community.

The IRCDL 2016 edition, in line with the conference series tradition, was committed to preserving the emphasis on the multidisciplinary nature of the research on digital libraries that has been characterizing the conference over the years. This multidisciplinary nature ranges from computer science to humanities in the broader sense, including research areas such as archival and library information sciences, information management systems, semantic technologies, information retrieval, and new knowledge environments. This is a continued challenge for the DL field and there is the need to continue contributing toward improving the cooperation between the many communities that share common objectives.

IRCDL 2016 hit its target and once more provided the opportunity to explore new ideas, techniques, and tools, and to exchange experiences also from on-going projects. This volume contains the revised accepted papers selected, on the basis of reviewers' comments, from those presented at the 12th Italian Research Conference on Digital Libraries (IRCDL 2016). The conference was organized by the Department of Information Engineering of the University of Florence, Italy, during February 4–5, 2016. The conference was held at the Murate Complex, using the facilities provided by the NEMECH (New Media for Cultural Heritage) Center of Competence established by the Tuscany Region and the University of Florence; the NEMECH Centre promotes the transfer of know-how of research from the university laboratories to the places where cultural goods are exposed and benefited.

The Program Committee comprised 21 members, including representatives of the most active Italian research groups on digital libraries. The Program Committee accepted 70% of the papers presented at the conference for inclusion in this volume, which contains expanded versions of the conference papers. These papers were reviewed again and the results of the final selection are the papers appearing in these proceedings. The topics covered and that reflect the interests of the community are:

- Formal methods
- Long-term preservation
- Metadata creation, management, and curation
- Multimedia

#### VI Preface

- Ontologies and linked data
- Quality and evaluation
- System interoperability

Here we would like to thank those institutions and individuals who made this conference possible: the committees members, the Department of Information Engineering of the University of Florence, the NEMECH Center of Competence, and the MICC Center of Excellence in the area of new media.

December 2016

Maristella Agosti Marco Bertini Stefano Ferilli Simone Marinai Nicola Orio

#### **Organization**

IRCDL 2016 was organized by the Department of Information Engineering and the Media Integration and Communication Center (MICC) of the University of Florence.

#### **Executive Committee**

#### **General Chairs**

Simone Marinai University of Florence, Italy Marco Bertini University of Florence, Italy

#### **Honorary Chairs**

Maristella Agosti University of Padua, Italy Costantino Thanos ISTI CNR Pisa, Italy

#### **Program Chairs**

Stefano Ferilli University of Bari, Italy Nicola Orio University of Padua, Italy

#### **Steering Committee**

Maristella Agosti University of Padua, Italy

Tiziana Catarci Sapienza University of Rome, Italy Alberto Del Bimbo University of Florence, Italy

Floriana Esposito University of Bari Aldo Moro, Italy

Carlo Tasso University of Udine, Italy Costantino Thanos ISTI CNR Pisa, Italy

#### **Program Committee**

Andrew Bagdanov University of Florence Stefano Berretti University of Florence

Rosa Caffo President of the MICHAEL Culture AISBL

Diego Calvanese Free University of Bozen-Bolzano

Vittore Casarosa ISTI CNR Pisa, Italy Michelangelo Ceci University of Bari, Italy

Fabio Ciotti University of Roma Tor Vergata, Italy

Rita Cucchiara University of Modena and Reggio Emilia, Italy

Nicola Ferro University of Padua, Italy

#### VIII Organization

Costantino Grana University of Modena and Reggio Emilia, Italy

Maria Guercio Sapienza University, Italy Trinity College Dublin, Ireland Séamus Lawless

University of Bari, Italy Donato Malerba ISTI CNR Pisa, Italy Paolo Manghi Sapienza University, Italy Antonella Poggi David Rizo Valero University of Alicante, Spain Sapienza University, Italy Marco Schaerf University of Padua, Italy Gianmaria Silvello

President at Open Edition Italia Anna Maria

Tammaro

Francesca Tomasi University of Bologna, Italy Paul Weston University of Pavia, Italy

#### **Sponsoring Institutions**

University of Florence MICC Center of Excellence

### **Contents**

The Archivio dei Possessori of the Biblioteca Nazionale Marciana.  A Provenance Database	3
An IT Support for an Exhibition of Illuminated Manuscripts	16
Motivating and Involving Users Through Gamification: A Proposal	20
Digital Scholarship Innovation and Digital Libraries: A Survey in Italy <i>Anna Maria Tammaro</i>	31
Multimedia	
Hermeneutic Implications of Cultural Encoding: A Reflection on Audio Recordings and Interactive Installation Art	47
Searching and Classifying Affinities in a Web Music Collection	59
Searching and Exploring Data in a Software Architecture for Film-Induced Tourism	71
Semantics	
An Ontology to Make the DELOS Reference Model and the 5S Model Interoperable	85
Realizing a Scalable and History-Aware Literature Broker Service for OpenAIRE	92

#### X Contents

Stratifying Semantic Data for Citation and Trust:  An Introduction to RDFDF	104
Formal Components of Narratives	112
Evaluation	
Proposal for an Evaluation Framework for Compliance Checkers for Long-Term Digital Preservation	125
Towards Sentiment and Emotion Analysis of User Feedback for Digital Libraries	137
Layout	
Layout Analysis and Content Classification in Digitized Books	153
A Study on the Classification of Layout Components for Newspapers Stefano Ferilli, Floriana Esposito, and Domenico Redavid	166
Author Index	179