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(eds.)

Knowledge Acquisition from Multimedia Content

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Preface

In recent years significant advances have been made in the area of automatic extraction of low-level features from audiovisual content. However, little progress has been achieved in the identification of high-level semantic features or the effective combination of semantic features derived from different modalities. Knowledge acquisition is becoming a key-enabling factor of the above tasks towards more scalable and reliable solutions, and thus its automation is becoming critical. As the deployment of knowledge enhances the robustness of extraction while on the other hand the continuous extraction of semantic information can enrich this knowledge, synergistic approaches that combine multimedia extraction and knowledge evolution in a bootstrapping common framework introduce new opportunities in semantic multimedia applications. Integration with additional sources of information, e.g. by using human annotation tools or real-time event services, may further simplify and disambiguate semantic multimedia information systems. Moreover, adaptation to a particular domain, for example to sports events, such as the Olympic games, is essential in order to reduce the complexity of multimedia analysis. In this context, unified modeling and representation of multimedia and domain-specific knowledge, ontology evolution, and standard and non-standard inference services for multimodal semantic knowledge fusion, form cutting edge technologies.

The aim of this workshop is to intensify the exchange of ideas between the different research communities involved which range from multimedia analysis to reasoning with ontologies. The submitted contributions published in these proceedings therefore reflect current research in this area: the topics range from multimedia classification based on textual information, content based shot classification, feature extraction to image classification based on ontologies. The submitted papers cover different application domains, i.e. broadcasted news or legal documents.

We would like to thank all members of the program committee for supporting us in the reviewing process, the organizers of the main conference SAMT 2007 to which this workshop was co-located - especially Yannis Avrithis, Michela Spagnuolo and Francesco Robbiano - for their kind support throughout the organizational process. We also would like to thank the authors for their willingness to revise their initial submissions based on the reviewers comments. Finally we would like to thank our invited speakers, Fabio Ciravegna and Alan Smeaton for their willingness to give a talk at our workshop.

December 2007

Tobias Bürger, Vassilis Tzouvaras
Program Chairs KAMC 2007

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International Conference on Semantic and Digital Media Technologies (SAMT)

LIVE Staging of Media Events

European RTD context LIVE is an integrated, multidisciplinary initiative at European level that contributes to exploring and bringing to maturity Europe's intelligent content vision. LIVE will develop Knowledge and Content technologies in the sectors where Europe already has a leading position, e.g. digital interactive television within the media and telecom sector.

Short introduction The LIVE project will create novel content production methods and intelligent tools for interactive digital broadcasters. With this new approach Live Media Events such as the 2008 Summer Olympic Games will be an immersive experience for TV consumers. One of the main ideas of LIVE is the ability for TV consumers to influence the TV authoring of live content. This means for the professional user the ability to create a non-linear multi-stream video show in real-time by dynamically linking live and archived A/V material around a media event, which responds to the feedback of the consumer (end user). To enable this new form of live content authoring multiple incoming video streams and archival material will be indexed and structured by semiautomatic metadata extraction tools. Additionally, feedback coming in from the TV consumers over a back channel mechanism will be analysed by a recommender system. The semantic connections between the consumer preferences and annotated video material are then processed in real-time by an intelligent media framework and fed to the control room via the recommender system to guide the real-time staging process.

LIVE Results The LIVE project results aim at the development of semantic-based and user-context-aware systems to pioneer intelligent self-describing iTV content by creating an Intelligent Media Framework and creating intelligent video objects. These can integrate basic content with metadata and knowledge, which can support the new iTV video formats and services to stage live mass media events.

LIVE Consortium The coordinator is the Fraunhofer Institut Intelligente Analyse- und Informationssysteme, with the partners: Academy for Media Arts, Cologne, ORF Austria, Atos Origin, School of Informatics University of Bradford, University of Ljubljana, University of Applied Sciences Cologne, Salzburg Research and Pixelpark.

Further information <http://www.ist-live.org>



Coordinator: Dr. Joachim Köhler
(Fraunhofer IAIS, DE)

BOEMIE – Bootstrapping Ontology Evolution with Multimedia Information Extraction

The vision of evolving multimedia ontologies Multimedia content on the Web is growing fast, and information overload has become an obstacle towards the development of the knowledge society. The BOEMIE project is set to add meaning to these ever-increasing quantities of multimedia on the Web, and provide easy access to it. BOEMIE is developing a new methodology for knowledge extraction and evolution, using a rich multimedia semantic model. Methods and tools for automating knowledge acquisition from multimedia content are being developed. Driven by domain-specific multimedia ontologies, BOEMIE information extraction systems will identify high-level semantic features in image, video, audio and text and then fuse these features for optimal knowledge acquisition. These ontologies will be continuously populated and enriched using the already extracted semantic content. This approach is called bootstrapping, since the enriched ontologies will be used, in their turn, to drive the multimedia information extraction system. The results are expected to have a wide range of applications in commerce, tourism, e-science, news industry, business intelligence, etc. The users will be able to access knowledge in an efficient and intuitive manner.

Result and progress so far Multimedia, geographic and domain ontologies for the domain of athletics have been produced and integrated into a common BOEMIE semantic model. Novel extraction methods for images, video, audio, video OCR and text have been produced and integrated into the BOEMIE extraction toolkit. Advanced reasoning techniques for multimedia interpretation, based on abductive methods are also included in the extraction toolkit. Innovative ontology population, enrichment and coordination techniques have been produced and integrated in the BOEMIE ontology evolution toolkit. The first integrated prototype is under development and will be provided for evaluation by external users very soon. Additionally, a large corpus of annotated content for the various modalities has been produced and its public distribution for research purposes is being negotiated with the owners of the original content.

BOEMIE Consortium “NCSR” DEMOKRITOS (GR) [Coordinator]; Fraunhofer - IAIS (DE), University of Milano - DICO (IT), CERTH - ITI (Greece), Hamburg University of Technology (DE), Tele Atlas (NL).

Further information <http://www.boemie.org/>



Coordinator: Dr. Constantine D. Spyropoulos (NCSR Demokritos, GR)

Table of Contents

Invited Talks

Challenges and Methodologies for Knowledge Acquisition and Sharing in Large Distributed Environments	1
<i>Fabio Ciravegna (University of Sheffield)</i>	
Knowledge Acquisition & the Sensor Web	2
<i>Alan F. Smeaton (Dublin City University)</i>	

Session 1

Legal Knowledge Acquisition and Multimedia Applications	3
<i>Ciro Gracia, Pompeu Casanovas, Marta Poblet, Xavier Binefa and Jordi Carrabina</i>	
A Generic Framework for Semantic Medical Image Retrieval	18
<i>Manuel Moeller and Michael Sintek</i>	
Towards Semantic Multimedia Indexing by Classification & Reasoning on Textual Metadata	33
<i>Phivos Mylonas, Nikos Simou, Vassilis Tzouvaras and Yannis Avrithis</i>	

Session 2

Architecture for Mining Resources Complementary to Multimedia	47
<i>Jan Nemrava, Paul Buitelaar, Thierry Declerck, Vojtech Svatek, Josef Petrak, Andreas Cobet, Herwig Zeiner, David Sadlier, Noel O'Connor, Nikos Simou and Vassilis Tzouvaras</i>	
Semantic video classification based on subtitles and domain terminologies	57
<i>Polyxeni Katsioli, Vassileios Tsetsos and Stathes Hadjiefthymiades</i>	
Compressed Domain Features Extraction for Shot Characterization	71
<i>Costantino Grana, Roberto Vezzani, Daniele Borghesani and Rita Cucchiara</i>	

Author Index	81
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Challenges and Methodologies for Knowledge Acquisition and Sharing in Large Distributed Environments

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Short biography

Fabio Ciravegna is Full Professor of Language and Knowledge Technologies at the University of Sheffield. He coordinates the Web Intelligence Technologies Lab, involving 16 between academics, researchers and students. His research field concerns Human Language Technologies for the Semantic Web, with focus on Knowledge Management applications. Before joining Sheffield in 2000, he was researcher at ITC-Irst in Trento, one of the main research centres in Artificial Intelligence in Italy, where he coordinated the activity on Information Extraction from Text. From 1988 to 1993 he was researcher at Centro Ricerche Fiat where he coordinated the Natural Language activities.

Currently Fabio is:

1. Director of the Integrated Project IST X-Media on large scale knowledge management across media, involving 15 partners and with a budget of 13.6M.
2. Principal Investigator in the Integrated Project WeKnowIt on Collective Intelligence
3. Principal investigator in the DTI funded project IPAS co-sponsored by Rolls-Royce plc and the UK DTI
4. Principal Investigator in the FP7 Integrated Project WeKowIt on capturing Collective Intelligence, with applications to Emergency Services and Tourism.
5. Principal Investigator in Archaeotool, a project funded by the UK EPSRC for mining 1 million archaeological documents
6. Principal Investigator in industrial projects funded by Kodak Eastman Corp (on digital photography) and Lycos (on Web 2.0).

He is part of the editorial board of the “International Journal on Web Semantics” and of the “International Journal of Human Computer Studies”.

He Holds a PhD from the University of East Anglia and a Doctorship from the University of Torino, Italy

Knowledge Acquisition & the Sensor Web

Alan Smeaton¹

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Short biography

Alan Smeaton is a full Professor of Computing at Dublin City University where he is Director of the Centre for Digital Video Processing, a University-designated research centre of 45 full-time researchers. He was Dean of the Faculty of Computing and Mathematical Sciences from 1998 to 2004 and was Head of the School of Computer Applications from January 1999 to December 2001. He holds the B.Sc., M.Sc. and PhD degrees in Computer Science from the National University of Ireland.

His early research interests covered the application of natural language processing techniques to information retrieval (text) but this then broadened to cover the indexing and content-based retrieval of information in all media, text, image, audio and especially digital video and now the focus of his work is in information access for human digital memory applications. His major research funding is in the area of information analysis and access, particularly for digital video, and has also received funding for research in digital libraries, music IR and in web searching.

In 1994 Alan Smeaton was the chair of the 17th ACM SIGIR Conference which he hosted in Dublin and in 2001 he hosted an NSF-DELOS Workshop on Personalisation and Recommender Systems, also in Dublin. He was program co-chair of the ACM SIGIR Conference in Toronto in 2003 and general chair of the Conference on Image and Video Retrieval (CIVR) which he hosted in Dublin in 2004. In 2005 he hosted the European Summer School in Information Retrieval in Dublin. He has co-edited a book on Hypertext and Information Retrieval (Kluwer) and has published over 170 book chapters, journal and conference papers. He was an Associate Editor of the ACM Transactions on Information Systems for 8 years, and is a member of the Editorial Boards of Information Retrieval, Information Processing and Management, Foundations and Trends in Information Retrieval, the ACM Journal on Computers and Cultural Heritage and of the Journal on Digital Libraries.

In 2002 Alan Smeaton was awarded the DCU President's award for "outstanding research carried out in the field of Science and Engineering".