Guest Editorial

Multimedia Authoring and Annotation

Dick Bulterman • Pablo Cesar • Ethan Munson • Maria da Graça Pimentel

Special Issue - Multimedia Tools and Applications - Springer-Verlag 2014

Abstract With the massive amount of captured multimedia, authoring is more relevant than ever. Multimedia content is available in many settings including the web, mobile devices, desktop applications, as well as games and interactive TV. The authoring and production of multimedia documents demands attention to many issues related to the structure and to the synchronization of the media components, to the specification of the document and of the interaction, to the roles of authors and end users, as well as issues concerning reuse and digital rights management. Several complementary approaches to support the authoring of multimedia documents have been reported in the literature, and in many cases they have been studied via authoring tools and applications. One aim of this special issue is to assess current approaches, tools and applications, discussing how they tackle the main issues relative to the process of authoring, as well as their limitations. Another aim is to outline design issues for future tools and applications.

Keywords Authoring, Annotation, Ubiquitous Computing Environments, Metadata, Context-Awareness

1. Introduction

The authoring of multimedia documents demands attention to many issues relative to the structure and the synchronization of the media components, to the specification of the document and of the interaction, the roles of authors and end users, as well as issues concerning reuse and digital rights management. Researchers have discussed issues that include the need for referencing the media components, for specifying the synchronization and spatial the layout of the composition, for specifying asynchronous events and alternative content, as well as for offering options for performance optimization and producing multiple external formats. Open source multimedia authoring includes challenges in allowing open-ended, incremental and decentralized authoring.

Dick Bulterman
FXPAL
3174 Porter Drive, Palo Alto, CA 94304
USA
e-mail: dick.bulterman@cwi.nl

Pablo Cesar
CWI: Centrum Wiskunde & Informatica,
Science Park 123, 1098XG Amsterdam,
The Netherlands
e-mail: P.S.Cesar@cwi.nl

Ethan Munson
University of Wisconsin-Milwaukee
PO Box 784, Milwaukee, WI 53212
USA
e-mail: munson@uwm.edu

Maria da Graça Pimentel
Universidade de São Paulo
Caixa Postal 668, São Carlos SP 13560-970
Brazil
e-mail: mgp@icmc.usp.br

Users can access multimedia documents on personal computers, mobile devices or television sets, using the web or dedicated software and/or hardware. The interactive multimedia documents played back by users may be specified according to recommended formats for the web or for IPTV, although proprietary formats are used in services such as YouTube.

Everyday activities can be captured in instrumented ubiquitous environments to allow the automatic authoring multimedia documents. The opportunity for authoring by viewers has been studied in the context of single users, groups of collocated users, as well as distributed user groups. Challenges include ease of authoring both for viewers (singly or in groups) and for producers.

The live editing of the interactive multimedia documents, investigated in the context of structured-based paradigm, has been demonstrated on the server-side and on the viewer side. A key challenge is adaptation on both the server and viewer sides.

Approaches for supporting the authoring of adaptive, evolving and personalized documents have exploited the document structure, for instance, via reusing templates and via dedicated alphabets. Issues related to the need for adaptation have been studied in the context of ubiquitous environments, of mobile devices and of particular media, such as diagrams. In particular, the integration of secondary screens has been investigated in the context of multimedia documents for the TV. Authoring issues include dealing with various visual aspects of the generated documents**.**

In the last years, the area of multimedia authoring and annotation has been challenged due to the increasing amount of available media, the diversification of environments and devices, and the new role of end-users as authors. This special issue surveys this fascinating area, illustrating current research on approaches for simplifying the authoring of multimedia presentations (templates, automatic process), for the support of devices beyond the desktop (paper), and for the inclusion of novel media types in addition to the traditional audiovisual material (3D human motion).

2. Summary of Selected Papers for this Special Issue

This special issue is composed of seven carefully selected research papers:

The first paper “EDITEC - a graphical editor for hypermedia composite templates” is by Jean Ribeiro Damasceno, Joel André Ferreira dos Santos, and Débora Christina Muchaluat-Saade. The paper presents a graphical editor for hypermedia composite templates, EDITEC. The editor offers a user-friendly visual approach and a multi-view environment that gives users a complete control of the composite template during the authoring process.

The second paper “Composer: meeting non-functional aspects of hypermedia authoring environment” is by Roberto Gerson A. Azevedo, Eduardo Cruz Araújo, Bruno Lima, Luiz Fernando G. Soares, and Marcelo F. Moreno. The paper highlights the importance of non-functional requirements for the design of hypermedia authoring tools. The authors report their efforts for incorporating such requirements in Composer, an NCL authoring tool.

The third paper “A lightweight framework for authoring XML multimedia content on the web” is by Christine Vanoirbeek, Vincent Quint, Stéphane Sire, and Cécile Roisin. The paper addresses the research problem of authoring XML multimedia content on the web, based on templates. The tool presented in this article is intended for web users with limited skills, allowing them to produce various kinds of content.

The fourth paper “Towards an easy to use authoring tool for interactive non-linear video” is by Britta Meixner, Katarzyna Matusik, Christoph Grill, and Harald Kosch. The paper introduces SIVA Producer, an authoring tool for creating non-linear videos. Extensive evaluation of the tool, resulted in a significant improved of its usability, as reported in the paper.

The fifth paper "CASAM: collaborative human-machine annotation of multimedia" is by Robert J. Hendley, Russell Beale, Chris P. Bowers, Christos Georgousopoulos, Charalampos Vassiliou, Petridis Sergios, Ralf Moeller, Eric Karstens, Dimitris Spiliotopoulos. The paper proposes a collaborative environment, where humans and automated components cooperate for annotating media. The system interacts with users with the objective of using the human annotator's time more effectively and with the goal of obtaining annotations both of higher quality and produced more quickly. The system was evaluated with media professionals.

The sixth paper "Advanced authoring of paper-digital systems" is written by Beat Signer, Moira C. Norrie, Nadir Weibel, and Adriana Ispas. The paper studies paper-digital applications. The authors present an authoring approach, based on templates and variable content elements, for the production of interactive paper documents. The biggest benefit of the proposed solution is that it does not require from the author programming skills.

Finally, the seventh paper "Motion recognition for 3D human motion capture data using support vector machines with rejection determination" is by Meiling Cai, Beiji Zou, Huanzhi Gao, and Juan Song. The paper introduces a motion recognition strategy capable of extracting meaningful actions according to a given set of motion classes. The motion recognition model was successfully evaluated on various experiments with synthetic and real data from freely available sets of motion capture database.

3. Final Thoughts

The papers included in this special issue are representative of the current research challenges faced by the multimedia authoring community - large amounts of media content in the web, diversity of rendering devices, complexity of stories, and social relationships between authors and people portrayed in the media. Based on the articles, we can conclude that providing the right form of authoring tools for non-professionals is still a non-trivial task. We hope these papers are a valuable resource for scholars and practitioners who want to better understand the state of the art and the upcoming challenges in this fascinating field.

Reviewers

Biographies

Dr. Dick Bulterman is President of the FX Palo Alto Laboratory in California, a senior researcher at CWI in Amsterdam, and holds the professorship of Distributed Multimedia Languages and Interfaces with the department of computer science at the Vrije Universiteit in Amsterdam. His research interests include multimedia authoring and document processing. His recent research concerns socially-aware multimedia, interactive television, and media analysis. Together with his CWI colleagues, he has won a series of best paper and research awards within the multimedia community, and has managed a series of successful large-scale European Union projects. He was also the founder and first managing director of Oratrix Development BV. He is past program chair and past general chair of the ACM DocEng Symposium. He is also past chair of ACM Multimedia of and IEEE ISM. Webpage: http://homepages.cwi.nl/~dcab/

Dr. Pablo Cesar (P.S.Cesar@cwi.nl) leads the Interactive and Distributed Systems (DIS) group at Centrum Wiskunde & Informatica (CWI) in the Netherlands. He received his Ph.D. from the Helsinki University of Technology in 2006. He has (co)authored over 70 articles (conference papers and journal articles) about multimedia systems and infrastructures, social multimedia, multimedia content modelling, and user interaction. He has been active in a number of European projects such as Passepartout, SPICE, iNEM4U, TA2, Reverie, and Vconect. He has given tutorials about multimedia systems in prestigious conferences such as ACM Multimedia and the WWW conference, and is co-editor of the book "Social Interactive Television: Immersive Shared Experiences and Perspectives" (2009). Webpage: http://homepages.cwi.nl/~garcia/

Ethan Munson (munson@uwm.edu) is Professor and Co-Chair of Computer Science and Director of the Multimedia Software Laboratory at the University of Wisconsin-Milwaukee in the USA. He received his Ph.D. in Computer Science from the University of California, Berkeley in 1994 and holds earlier degrees in both Computer Science and Psychology. He has numerous publications and patents in a wide range of topics including document engineering, multimedia authoring, software engineering, photogrammetry and human-computer interaction. He is the former Chair of ACM SIGWEB and has long been active in the document engineering research community.

Maria da Graça Pimentel (mgp@icmc.usp.br) is Professor of Computer Science at the Universidade de São Paulo in Brazil. She received her Ph.D. in Computer Science from the University of Kent at Canterbury in 1994. She has published extensively in the areas of ubiquitous computing, interactive television, multimedia systems, document engineering, human-computer interaction, and hypertext. She has been a leader of many large research projects including TIDIA-Ae and INCA-Serve and has served as an elected officer of ACM SIGWEB since 2007. She has also been, for many years, one of the leaders of the Multimedia and Web community of the Brazilian Computer Society.