
4th International Workshop on Interactive Content Consumption (WSICC'16)

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Abstract

WSICC has established itself as a truly interactive workshop at EuroITV'13, TVX'14, and TVX'15 with three successful editions. The fourth edition of the WSICC workshop aims to bring together researchers and practitioners working on novel approaches for interactive multimedia content consumption. New technologies, devices, media formats, and consumption paradigms are emerging that allow for new types of interactivity. Examples include multi-panoramic video and object-based audio, increasingly available in live scenarios with content feeds from a multitude of sources. All these recent advances have an impact on different aspects related to interactive content consumption, which the workshop categorizes into Enabling Technologies, Content, User Experience, and User Interaction. The resources from past editions of the workshop are available on the <http://wsicc.net> website.

Author Keywords

workshop; multimedia; content consumption; interaction; HCI; user experience;

ACM Classification Keywords

H.5 [Information Interfaces and Presentation]:
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Figure 1: Mindmap result of WSICC'13.



Figure 2: Mindmap result of WSICC'14.



Figure 3: Mindmap result of WSICC'15. Available in better resolution on the website. All mindmaps are currently being digitized by the organization team to be further analyzed for scientific publication of the workshop results.

Workshop Aims and Scope

WSICC's objective is to provide a highly interactive discussion forum that allows capturing a comprehensive view on the research area it addresses. During the workshop, an overview on new content interaction concepts, research activities, and future challenges in this area is concluded and documented. An interdisciplinary view on the topic is compiled by contributions from technical research, conceptual work, user-centric studies, industry developments, as well as experimental showcases. In other words, the workshop aims to examine and evaluate new forms of content interaction by discussing the field along three axes:

- **Recent technological advances** that enable new forms of audiovisual content interaction;
- **User-centric studies** that evaluate new types of audiovisual content interaction, especially in the realm of societal trends and media consumption paradigm shifts;
- **Studies from industry** considering and evaluating user needs and the impact of advances in this area.

As another way to look at the workshop's scope, as also done in previous workshop editions, the research landscape was characterized along four dimensions (see Figures 1-3): Enabling Technologies, Content, User Experience, and User Interaction. The following taxonomy defines the workshop's scope by examples:

Enabling Technologies: This dimension searches for technology and tools for consumption and authoring of interactive content, especially:

- Techniques for content adaptation, rendering, and converting for a wide variety of devices and delivery channels;

- Approaches for interactive personalization and recommendation (e.g., Virtual Director approaches);
- Research on interactive and adaptive content delivery (e.g., MPEG-DASH);
- Studies on immersive devices, such as VR goggles, wearables, and cyber-physical systems;
- Novel approaches in content production technology (object-based or format-agnostic);
- Novel media coding technologies that inspire interactivity (e.g., H.265/HEVC tiling);
- Tools to infuse interactivity in passive content;
- Approaches for media synchronization and orchestration.

User Experience: The user experience dimension explores research on quality of user experience (QoE) theory and evaluations, the impact and effects of interaction on perceived quality, the role of the audience, and the role of social context. It investigates the effect of increased interactivity and user engagement, empowerment, but also overload and distraction, e.g.:

- Studies and foundations from the social sciences;
- Evaluation of user needs regarding personalized content consumption;
- Research on collaborative and community-based multimedia consumption and creation;
- Exploration of immersive audiovisual content;
- Approaches for inclusion and improved accessibility (e.g., automatic content enhancement for special needs).



Figure 4: Fishbowl discussion at WSICC'13.



Figure 5: Fishbowl discussion at WSICC'14.



Figure 6: Fishbowl discussion at WSICC'15.

User Interaction: This dimension analyzes novel interaction approaches, concepts, and paradigms. Thereby, interactivity might be interpreted both as computer mediated communication as well as human computer interaction. Interest lies in:

- Research on natural interaction techniques;
- Experiments on multi-modal interaction and social signal processing, especially gesture control and speech recognition;
- Studies on social interaction during content consumption and mobile content consumption;
- Methods of feedback for user control, including visual, acoustic, and tactile interaction;
- Studies on lean-forward interaction trends and joint interaction of larger groups;
- Studies on the balance between active (lean-forward) and passive (lean-backward) content consumption.

Content: The content dimension researches new types and forms of interactive content, such as:

- Content from gaming or the mobile, AR and VR domains;
- Live and recorded materials;
- Data representation formats for interactive content;
- Adaptable content and content of variable length;
- High-quality and ultra-high definition content;
- Content captured by novel types of sensors (e.g., 3D, panoramic, or 360° video).

Beyond these four areas, the workshop welcomes discussion on best practices, future challenges, and research road-mapping in the area of interactive content consumption.

Workshop Format

WSICC has developed an interactive workshop format to stimulate both networking and knowledge transfer among the participants. The full day workshop is an active forum to discuss research challenges, methodologies, and results in a field that maintains relevance in an ever-changing landscape of new device types, content forms, and growing technical infrastructure. Both media consumption needs and habits are constantly evolving.

More than half the time is reserved for discussion. The chairs aim at establishing an informal atmosphere, inspired by the basic principles of the Barcamp format¹. In an active moderating role, they make sure the workshop's underlying questions are discussed, answered as far as possible, and documented. Nevertheless they allow some flexibility in order to meet the interest of the audience spontaneously, as appropriate.

Both organizers and participants collect inputs on large flip charts along multiple question dimensions throughout the day. During the workshop, the audience is encouraged to contribute, and especially to comment existing inputs (*I'd love to collaborate on this!... This has already been solved in my project!*). The outcome of the workshop is summarized on a poster for presentation at the main conference, based on the inputs accumulated on the flip charts. A publication summarizing the workshop results is submitted to <http://ceur-ws.org/>. Further, the WSICC

¹See <http://en.wikipedia.org/wiki/BarCamp> (accessed 03/25/16)

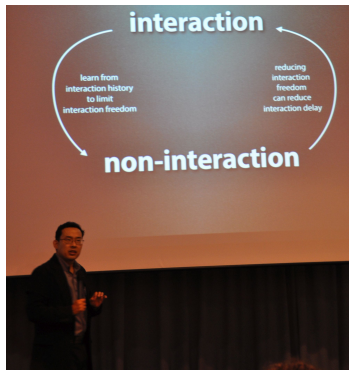


Figure 7: WSICC'13 keynote by Wei Tsang Ooi.



Figure 8: WSICC'14 keynote by Marian F. Ursu.

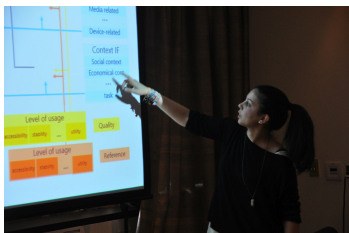


Figure 9: WSICC'15 keynote by Judith Redi.

organization team gives a short overview of inputs from previous editions (mind maps) and from the MTAP Special Issue *Interactive Media: Technology and Experience* to process the results of the last years for the scientific community.

Some of the results from previous editions are accessible via the workshop website² which already contains the 2014 proceedings³, a link to the 2015 proceedings published on CEUR-WS.org⁴ (2013's were part of the adjunct EuroITV proceedings⁵), and visual impressions^{6,7,8}.

WSICC'16 consists of the following sessions:

- *Welcome*, introduction to the workshop format, and presentation of workshop aims;
- *Interactive participant introduction* in Barcamp style (name, affiliation, role, 3 keywords/hashtags);
- *Invited keynote* about emerging research related to one or more of the focus areas of the workshop, as an input to the interactive sessions (see Figures 7-9);
- A *guided tour* session to kick-start the poster/demo session, each contribution is introduced via a short 5 minute pitch in front of the poster or demo;
- The *poster and demo session*: Posters are based on short paper contributions; technical demos are

²<http://wsicc.net/> (accessed 03/25/16)

³<http://wsicc.net/2014/Proceedings-WSICC-2014.pdf> (accessed 03/25/16)

⁴<http://ceur-ws.org/Vol-1516/> (accessed 03/25/16)

⁵<https://sites.google.com/a/euro-itv.org/2013/program/proceedings> (accessed 03/25/16)

⁶<https://www.flickr.com/photos/49520289@N04/sets/72157634457839167/> (accessed 03/25/16)

⁷<https://www.flickr.com/photos/49520289@N04/sets/72157645061214918/> (accessed 03/25/16)

⁸<https://www.flickr.com/photos/49520289@N04/albums/72157651953922744> (accessed 03/25/16)

regarded an essential part of the workshop as they allow discussion upon hands-on experience. This session shall establish an understanding of everybody's work, focus, and interest;

- Three research paper based *talks*: In line with the informal atmosphere, questions are allowed during the talks;
- Two sessions in *fishbowl* discussion format, focusing on aspects raised during WSICC. In a nutshell, there is a limited number of active seats. If you want to say something, you have to take an empty active seat or wait for one to become available. This format of a dynamically changing working panel has empirically proven to work well for discussions among experts on concrete questions. Attendants of previous WSICC editions readily understood the fishbowl approach and were able to quickly adopt its methodology (see Figures 4-6);
- *Concluding session* where the group revisits the knowledge and insights that have been collected throughout the day; conclusions are summarized and a best paper award is given to one contribution regardless of its type.

Organizing Committee

The bios of the organizational team can be found below. The team represents the workshop's target audience in the areas of technical research, social sciences research, and industry. Team members complement each other well and are dedicated to contribute to the research community by conducting their respective activities. The team continues to stimulate discussions within the community, using social media platforms.



Figure 10: Group photo at WSICC'13.



Figure 11: Group photo at WSICC'14.



Figure 12: Group photo at WSICC'15.

Britta Meixner⁹ is a researcher at FX Palo Alto Laboratory. She received her PhD degree in computer science at the University of Passau, in 2014 (Title of the thesis: “Annotated Interactive Non-linear Video Software Suite, Download and Cache Management”). Britta is a reviewer for the MTAP Journal (Springer), an associate chair for TVX2015 and TVX2016, and was a (co-)organizer of WSICC at TVX2014 and TVX2015. She is an awardee of the ARD/ZDF Förderpreis “Frauen + Medientechnologie” 2015 (2015 Award “Women + Media Technology”, granted by Germany’s public broadcasters ARD and ZDF) and received a Honorable Mention recognition from the ACM SIGMM in the 2015 SIGMM Outstanding PhD Thesis Award.

Werner Bailer¹⁰ is a key researcher of the audiovisual media group at the DIGITAL – Institute of Information and Communication Technologies at JOANNEUM RESEARCH in Graz, Austria. He received a degree in Media Technology and Design in 2002 for his diploma thesis on motion estimation and segmentation for film/video standards conversion. His research interests include digital film restoration, audiovisual content analysis and retrieval, as well as multimedia metadata. He is contributing to multimedia standardization activities in the W3C, MPEG and EBU/AMWA FIMS.

Maarten Wijnants¹¹ is a post-doctoral researcher affiliated with iMinds, a research institute founded by the Flemish Government in Belgium. He received his PhD in computer science at the Expertise Centre for Digital

⁹<https://www.linkedin.com/in/britta-meixner-35892545> (accessed 03/25/16)

¹⁰<https://www.linkedin.com/in/wbailer> (accessed 03/25/16)

¹¹https://www.researchgate.net/profile/Maarten_Wijnants2 (accessed 03/25/16)

Media, the ICT research institute of Hasselt University, in 2010. The title of his PhD dissertation is “Service Quality Improvement and User Experience Optimization by Introducing Intelligence in the Network”. Maarten is currently participating in the EU FP7 ICoSOLE project, where he is involved in the work package dealing with playout and (adaptive) delivery. His research interests include multimedia networking, network bandwidth brokering, QoS, QoE, Web-based technologies and HTTP adaptive streaming. Maarten has been a TPC member for the two most recent editions of the international WEBIST conference.

Rene Kaiser is a key researcher for JOANNEUM RESEARCH and has been involved in a number of European projects dealing with automation of content production such as NM2, APOSDLE, FascinatE, TA2 and Vconnect. His research focus is on *Virtual Director* software, on automating the selection/editing of live video streams by executing cinematographic behavior models in real-time. Rene is a PhD student at TU Graz and head of the Knowledge Management Forum Graz. He has co-organized every WSICC edition since 2013. Rene also organized the Interactive and Immersive Entertainment and Communication Special Session at MMM'12. He is part of a group hosting the annual PhD cooperation workshop at the i-KNOW conference, active member and E-Letter chair of IEEE STCSN, and co-organizer of the Barcamp Graz, a yearly 3-day *unconference* which is an interactive and open discussion format.

Joscha Jäger¹² is a researcher at Merz Akademie Stuttgart and interface designer at yovisto GmbH in Potsdam, Germany. His research covers Web-based

¹²<https://de.linkedin.com/in/joschajaeger> (accessed 03/25/16)

hypervideo technology, time-based interaction, and semantic video search interfaces. Joscha has a strong focus on film as information architecture, collaborative editing systems for non-linear film, and user-driven annotation systems. He is interested in finding new ways of distributed interaction with open video technologies and interfaces on the web. He co-organized WSICC at TVX2014 and TVX2015.

Rik Bauwens¹³ attended Hogeschool Gent and obtained his MSc in Applied Engineering (Computer Science) in 2011. Thereafter, he studied English and music, whilst developing web applications for third parties. In 2012, he co-founded an e-learning project, followed by the development of a health care web application. He was responsible for R&D, design and database/server management. Rik is passionate about innovation in web technologies and new media. In 2014, he joined VRT Research & Innovation.

Frank Bentley¹⁴ is a Principal Researcher at Yahoo in Sunnyvale, CA where he focuses on systems that use content to inspire communication as well as leads user research for the Search organization. Frank was the program chair for ACM TVX in 2015 as well as teaches Mobile HCI classes at MIT, on EdX, and at Stanford. He has built and studied a wide variety of mobile video applications as well as studied how people interact with mobile devices and online services while watching television.

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¹³<https://be.linkedin.com/in/rik-bauwens-8068123a> (accessed 03/25/16)

¹⁴<https://www.linkedin.com/in/frankbentley> (accessed 03/25/16)