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Kultur und Informatik

Mixed Reality

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Preface

Culture and Computer Science – Mixed Reality

The 15th edition of the "Culture and Computer Science" conference series brings into focus best practice examples, challenges and future trends in the fields of Mixed, Augmented and Virtual Reality, media integration, cross media technologies, modelling, visualisation and interaction. The conference targets professionals working within cultural and creative industries, communication and cultural scientists, designers, artists as well as computer scientists and engineers, who conduct research and development on cultural topics.

The central questions of the conference "Culture and Computer Science 2017 – Mixed Reality" include the analysis, design, use, advantages, as well as challenges of hybrid objects. These key issues are not only discussed during the conference, they are part of an ongoing academic discourse on merging the analogue materiality of objects and the digital versatility of data i.e. at the Cluster of Excellence "Image Knowledge Gestaltung. An Interdisciplinary Laboratory" at the Humboldt-Universität zu Berlin, the V&A Research Institute (VARI) at the Victoria and Albert Museum in London, or at the University Lüneburg in the research centre "Medienkulturen der Computersimulation (MECS)". In this context, museums are not only static memory spaces for material objects with some additional selected, and hence also static, knowledge. On the contrary, we are beginning to see and to design the consequences of a constructivist approach in which objects are no longer just prerequisite but also an effect of our interactions with them. Objects are what we know about them, how we measure them, how we design and exhibit them, and how they interact with the surrounding space. We create objects to the same extent as they create us.

With this in mind, the key challenge for tomorrow's museums is to create flexible constellations between collections, research facilities, museums and exhibition spaces, in which objects are modelled as hybrid, (inter-)active structures in order to circulate them, to aggregate and to evaluate the resulting data. The implementation of hybrid objects in Mixed Reality environments has to be explored and the theoretical fundamentals and best practice examples of their strengths, weaknesses and innovative content must be discussed.

In this field, the contributions collected in this volume represent multifaceted approaches towards hybrid exhibition strategies and analyse, demonstrate, and, in particular, discuss current research and developments around "Mixed Reality". The authors of this volumes come from 15 different countries and hence give an extensive international overview of fundamental theories as well as best practice applications of information management, communication, interaction, visualisation, Mixed, Augmented and Virtual Reality, audio technology, multimedia, streaming and data processing, and design within a specific cultural context.
The contributions analyse and discuss the following key topics:

- Mixed Reality;
- Augmented Reality;
- Virtual Reality;
- Design;
- Participatory design;
- 3D technologies;
- Digitalisation in the cultural and creative industries;
- Visualisation and interaction technologies;
- Interactive multimedia solutions for museums, concert halls, exhibitions etc.;
- Virtual reconstructions;
- Digital storytelling;
- Indigenous knowledge;
- Interdependence between culture and computer science;
- The media-compatible treatment and enhancement of information; and
- Social and ethical issues in computer science.

Based on best practice examples, recent developments and requirements are presented in the areas of Mixed, Augmented and Virtual Reality, the use of live data sources for augmentation as well as their visualisation and interaction in concert halls, exhibitions and museums. To present content only in the form of texts, films and stories no longer matches the requirements of today's visitor. Instead, there is an urgent need for new approaches to interconnect the analogue and the digital realm and to find fluid modes of visualisation and interaction between these two worlds. Contemporary museum visitors no longer want to experience objects or to consume information. The wish

to be an active and formative element of the knowledge space, affecting the museum in the same way as the presence of the objects. This interaction of visitors, objects and data space is the focus in many of the papers, including concrete ideas on technical solutions.
In addition to four invited keynote papers, more than 50 papers were submitted. Each paper was reviewed by three different members of the international programme committee. Our thanks go to the members of the programme committee for their assistance in reviewing the numerous submissions.
The international programme committee selected 23 papers and grouped the contributions, together with the four keynotes, into the areas:

- Mixed Museum;
- Mixed and Augmented Reality Technology;
- Mixed and Augmented Reality Applications;
- Creating and Presenting Content;
- Mixed Reality and Interaction; and a
- Pecha Kucha session.

The stunning abundance of possibilities, which users have in present multimedia environment, virtual and real worlds, confronts both planners and computer scientists with new challenges. In order to allow cultural institutions to create new socio-digital environments, fluid knowledge spaces need to be established without neglecting the aims of imparting knowledge and cultural education. The papers in this volume will present different approaches and best practice examples to meet these challenges.
This and the previous editions of the series “Culture and Computer Science” are only possible with the continuous support by the “Staatliche Museen zu Berlin”. We thank in this context particularly the staff and the curators of the “Bode-Museum”, in whose premises we hold the conference “Culture and Computer Science – Mixed Reality”. The special atmosphere of the surroundings will certainly continue to have a lasting effect on all speakers and participants. In particular, we would like to thank Prof. Dr. Eisenhauer, Prof. Dr. Weisser and Bernd Rottenburg from the “Staatliche Museen zu Berlin” for their support of and engagement with the conference.

Our special thanks go to all authors, without whose creativity, ideas and hard work it would not be possible to run a wonderful conference and to produce these very interesting and inspiring proceedings.
This and all previous conferences “Culture and Computer Science”, as well as this publication, would not have been possible without the commitment of the staff and colleagues of our research group INKA at the University of Applied Sciences HTW Berlin. In particular, we would like to thank Kerstin Remes, Elisabeth Thielen and Michael Thiele-Maas.

Carsten Busch, Christian Kassung and Jürgen Sieck

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