

Pablo Cesar
Konstantinos Chorianopoulos
Jens F. Jensen (Eds.)

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Interactive TV: A Shared Experience

5th European Conference, EuroITV 2007
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Preface

The fifth edition of the European Conference on Interactive Television (EuroITV) was organized by CWI (Centrum Voor Wiskunde en Informatica), Amsterdam. Previously, EuroITV was organized by Athens University of Economics and Business (2006), Aalborg University (2005), and Brighton University (2004 and 2003). EuroITV07 was held in cooperation with the Association for Computing Machinery (ACM) and co-sponsored by the International Federation for Information Processing (IFIP).

The aim of the conference is to bring together researchers from different regions and diverse disciplines. This volume includes contributions from Europe, America, Asia, and Oceania, with researchers representing disciplines such as media studies, audiovisual design, multimedia, human – computer interaction, and management. This way, the conference tries to develop a common framework for this multi-disciplinary (usability, multimedia, narrative) and new field, interactive television. Because of the multi-disciplinary nature of the field, the conference was held in cooperation with the ACM Special Interest Group on Multimedia (ACM SIGMM), ACM Special Interest Group on Computer – Human Interaction (ACM SIGCHI), and ACM Special Interest Group on Hypertext, Hypermedia and Web (ACM SIGWEB).

Interactive television is a new field born from the digitalization of the transmission medium. This field is still in its infancy and, we hope, the EuroITV conference series will promote the field and helps to identify the scientific challenges, while presenting the current innovations from both industry and academia. This volume is divided into five sections: Social TV Systems, User Studies, The Future of TV, Social TV Evaluation, Personalization, and Mobile TV. The reader will find relevant and current research that deals with:

- Applications and systems: infrastructure and applications that provide an enhanced experience to television viewers.
- Usability evaluation: user-centered research regarding innovative applications.
- Social interactive television: since watching television is a shared experience, research is needed in order to accommodate new technologies for sharing interactive media at home
- Content personalization: the amount of digital content available for users is constantly increasing, hence research on content personalization is mandatory.
- Mobility: Hand-held devices already provide audio-visual support. What is the expected user interaction for such devices?

In addition to academia, industry played an important role in this conference. For this reason, this volume combines papers from academia and industry. Just to mention a few, Motorola, Microsoft, Philips, Nokia, Alcatel-Lucent, and BT

presented their work during the conference. This way, innovative ideas from industry were combined with theoretical studies from academia, providing the reader a complete overview of the current state of the art in the field.

Special thanks are due to Aalborg University (on behalf of EuroITV organization) for investing so much time and effort in providing a reliable and easy-to-use submission system. This year, without such a system, it would have been impossible to handle the 80 submissions for the conference.

Out of the 80 submissions, 24 articles (30% acceptance rate) were selected for this volume. Each of the papers was reviewed by at least three members of the Program Committee. In addition to this volume, the interested reader can consult the adjunct proceedings of the conference, in which work in progress papers, workshops, demos, tutorials, and doctoral consortium papers can be found.

Organizing a conference requires help from many people. In Amsterdam, much of the work was done by CWI's various support departments. Special thanks go to Dick Broekhuis (Treasurer), Wilmy van Ojik and Susanne van Dam (Local Arrangements Chairs), Tobias Baanders (Designer), Jan Kok (Web Support), Aad van de Klauw, and Henk Roose

Finally, thanks are due to all members of the Program Committee and external reviewers for their efforts in reviewing the contributions. The remaining pieces of the conference program were made possible by the efforts of Lyn Pemberton (Work in Progress Session Chair), Mark Howell and Ben Gammon (Demonstrations Chairs), Brunhild Bushoff and Chengyuan Peng (Tutorials Chairs), Liliana Ardissono and Artur Lugmayr (Workshops Chairs), and Judith Masthoff (Doctoral Consortium Chair).

We would like to express our gratitude to all the institutions that sponsored this conference. Special thanks go for UITV.INFO for acting as the communications sponsor and EuroITV organization for their effort in providing the submission system. Special thanks are due to the European Research Consortium for Informatics and Mathematics (ERCIM), the Royal Netherlands Academy of Arts and Sciences (KNAW), the Centre for Mathematics and Computer Science (CWI), and the New AMbient MUltimedia research group (Tampere) for their financial support.

March 2007

Pablo Cesar
Konstantinos Chorianopoulos
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Awareness and Conversational Context Sharing to Enrich TV Based Communication

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Abstract. This paper discusses domestic video calling over the TV and how such an experience might be enhanced through Awareness and Context Sharing. Video based Awareness will provide a sense of visually being together outside the call, such that users feel more connected and the perceived barrier to entry into the call is lowered. Rich Context Sharing within the call allows conversations to flow more freely as callers throw items from each others' lives onto the 'table' for discussion. We also discuss some mechanisms for transition between awareness and a context enriched call and structure the paper around a family scenario.

1 Introduction

The failure of video conferencing to become a mainstream application since its introduction 50 years ago, has been much documented [1][2]. However the ubiquity of cheap broadband, the maturity of video codecs and the availability of webcams has heralded a resurgence of use over the internet. Where financial cost is no longer an issue, video based conversation is an attractive proposition for some consumers. Broadband enabled set-top boxes and games consoles also permit the transition of video communication off the PC and onto the TV. In many instances, however the current manifestation of video chat applications are engineering solutions whose key aim is the transmission of moving images across a network, with little account of the human issues [3][4][5].

Of particular interest to this paper are the digital on/off nature of current call based metaphors and the narrow fixed view point that a video call provides. Firstly, when people share a physical space such as a home or open plan office, they have a continual sense of visual awareness of each other. This provides the impression of shared activity that helps foster connectedness [6]. In contrast, communication is completely shut off when a video call comes to an end.

The second issue concerns activity within the explicit foreground parts of the conversation. A video call typically provides one fixed, narrow viewpoint onto the other. The eye is unable to wander and any clutter that is visible just detracts [7] from the conversation, this is in marked contrast to face to face conversations, where items in the environment can stimulate and shape the conversation.

We will discuss solutions to these two areas later. A challenge remains as to how to bridge these two endpoints. How might users transition seamlessly from a state of background visual awareness to active context sharing and foreground communication on the TV?

Rather than attempt to solve this issue for all potential users and situations, we concentrate on a single domestic scenario.

2 Scenario

Our scenario concerns a family situation where one member works away from home during the week; in this case the father, Gary who works in Brussels (NATO employee), Belgium during the week and then returns to his family in Ipswich, UK at weekends. He has a wife Sue and three children Bart 5, Jez 9 and Rebecca 11. In the home in Ipswich all four share close awareness of each other, but Gary only joins them briefly and quite tired for a short couple of days each week ¹.

How can Gary keep in touch with his family? How can he maintain his relationship with his wife and participate properly as a parent. Bart, the youngest is starting school soon and life is changing rapidly for him, how can Gary keep up with all these changes and provide the support that Bart needs?

Normally Gary tries to phone home one or two evenings a week, but catching up with everyone is hard; Bart is often on his way to bed and finds it difficult both to relate to this voice on the phone and remember coherently what he's done that day. Sue laments the difficulties of keeping the rabble under control, the lack of a father figure and the need for a hug at the end of a long day.

3 Related Work and Background

3.1 Awareness

Traditionally it has been thought that the goal of electronic communication is to provide very rich media - sight, stereo, sound, touch. However, as Nardi [6] notes, the single bit of information on an instant messenger client, that a friend is online, is sufficient to provoke feelings of warmth and closeness.

From her study of the ability of existing electronic media to support relationships, Nardi goes further to posit three underlying dimensions to connectedness - affinity, commitment and attention. The first dimension, Affinity, is not so much concerned with explicit information exchange as the implicit background trickle of non verbal behaviour that occurs when people spend time together or engage in shared activities. It is here that the instant messenger example above falls, the status icon providing information that the friend is online at the same time. We can term this background exchange as Awareness.

¹ As a reference, of the 300 thousand employees in Brussels, 1400 work abroad. Regarding our scenario, 91 of those work in the UK [8].

It is worth noting briefly that awareness can also affect the other dimensions - users might perform deliberate actions (expressing commitment) so that the other gains good awareness of them, it may also indicate that now is a good time to contact the other (capturing attention).

There has been a relatively long history of the provision of awareness in research institutions. Xerox PARC's original 'Media Space' (1986) allowed the flexible connection of always on audio-video connections between offices and common spaces [9]. It was not unusual to find that users had connected the monitor in their office to one of the common spaces. As people walked across this space or doors banged, the office dweller became aware of the shared activity. Portholes (1997) [10] formalised this usage by creating an awareness only medium. A virtual common space was created as a grid of images. Each image represented a user and was taken at regular intervals from a webcam in the user's office.

More recently there has been a focus on awareness systems in the home. Designing for the home is different to the workplace, and awareness systems have been developed to specifically address the differences. For example privacy in the home is highly valued and to respect this need some home awareness systems have sought to use only abstract measures of presence [13][11][12]. Howard [14] provides a good overview of a range of recent systems, and draws a distinction between systems that enable contact and those that allow the exchange of content. Howard notes that some designers feel exchanging content can actually be limiting to our ability to affectively communicate. Dey [13] suggests that abstract measures of contact such as instant messenger status can be sufficient to support connectedness.

3.2 Conversational Context Sharing

Consider visiting the home of a friend. As they disappear into the kitchen to fetch you a coffee, your eye wanders round their living room. You take in the books they have left artfully scattered on the table, the new items in their CD rack and the pictures on the walls. The trust and vulnerability they have displayed by leaving you alone amongst their private possessions allows you to build a greater understanding of them, provides topics of conversation, and strengthens the relationship. As CD and photo collections become digital, it becomes possible to restore this activity of sharing context, in a virtual sense, within a video call.

Bente Evjemo et al. reported in their paper, 'Supporting the distributed family: The need for a conversational context.' [15]: that in grandparent to grandchildren conversations the face-to-face conversation was tied to the concurrent activity and that phones do not have this type of communication support. Through focus group research they offered their target group a solution where the context of the children and grandparents was shared through introduced screens. Their conclusion was that context sharing in addition to the phone call conversation was perceived appealing, where if context was highlights of activities (like videos and picture snapshots), the appeal was at its highest.

On context and or content sharing in a remote collaboration environments, there has been a significant body of research. Most, however, within the field of