Vconect Newsletter August 2012

Introduction

Since its kick off meeting in December 2011 the Vconect (Video Communication for Networked Communities) project partners, through a series of workshops and user trials, have made important inroads into the exploration of its vision of incorporating high-quality, intelligent video into social networking experiences and creating a new medium for mass communication.

Figure 1 Kick off meeting 2011

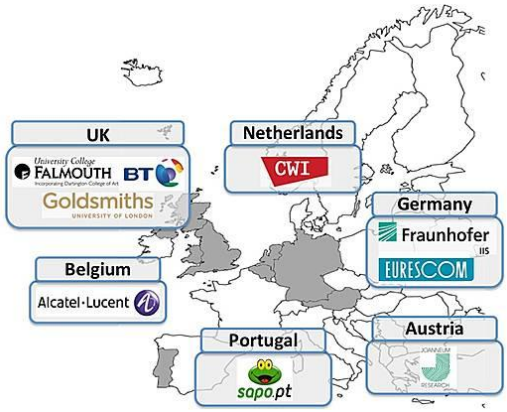

Figure 2 Vconect project partners

The Vconect project consortium consists of nine partners from six European countries with a comprehensive skill mix. We have four industry partners, two of them telecommunication operators, three research organisations and two universities.

Vconect aims to develop capabilities that will allow ad-hoc groups of people to enjoy real-time high-quality audio-video communication.

First Experiments

Vconect is designing a new platform with the help of two different use cases, one led by University College Falmouth (UCF) in the UK and one led by SAPO, the Internet and social networking business of Portugal Telecom.

UCF is exploring a space in which actors and dancers, in different places, possible even different countries, can interact over a mediated link to create a new kind of performance. Artistic performances also need audiences and the project will explore how a virtual audience, in many different countries, could be incorporated into the performance space

Figure 3 Dancers experiment with the video link

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A set of user trials were carried out at Falmouth in May 2012 to explore what might be the requirements of such a system. The trials involved participating students from the dance and theatre programmes at the university and involved a comparison between their experiences of performing and improvising together both when in the same room and across a video link.

The comments from the dancers pointed to just how Vconect type technologies might change their lives and performance experiences. The actors in particular were inspired by the technology to devise a new style of performance. They "worked" the camera, sometimes they were close-up to the camera, sometimes further away or they pretended that the two connected studios were linked via a virtual tablecloth, acting over the divide with the help of "out-of-shot" actors to make it appear that they shook each other's hands across the link.

Figure 4 The actors used the video link to create a parliamentary chamber

The outcomes of the experiment also suggested that the Vconect approach of applying multiple cameras using a variety of camera angles, and video orchestration (see below) may go some way to making mediated performance more successful along with a richer audio-visual and sensing environment.

Upcoming Experiments

SAPO is soon to run significant large scale user trials using its Bench App integrated within its existing online offering Pond. Pond is a social media aggregator and publisher that allows you to follow your friends, collect information about them and share your own content in some of the most popular online social content services available.

The first experiments will involve between 500-1000 participants and the aim is to explore information about how people might use a combination of social networking services, video conferencing, media sharing and synchronous video watching. In particular, we will focus on hypotheses about user profiles, user behavior, user preferences and technical requirements.

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Technological Highlights

Orchestration

Consider two groups at two remote locations engaged in a video chat. How could the local interaction be best transmitted to another location? How could the details of the actions they perform be best transmitted to the other location? How could their movements be followed? In an ideal world each location would be covered by a number of cameras, ideally able to move (pan, tilt and zoom), and a number of microphones. Different perspectives and levels of detail could thus be captured and conveyed to the other ends, rather like the editing of a TV programme.

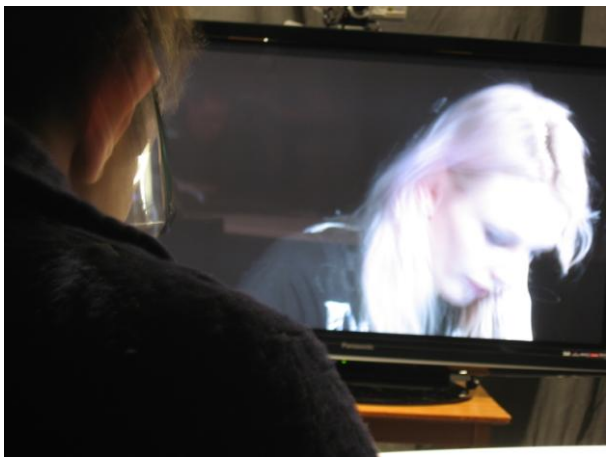

Figure 5 Video orchestration with a close up

The Vconect system aims to do just that with the help of orchestration. *Cues* to what is happening are extracted automatically from the audio-visual streams coming off webcams and studio cameras or from special sensors or are events that are issued directly by the end users as requests or commands. Examples of the former include "who is actively talking" and "who has joined or left a communication session" and the latter a "request to bring a video clip into the conversation" or a "request to directly contact a particular person."

These cues are then interpreted by an *orchestration intelligence* which chooses which camera(s) or viewpoint(s) to place on individual screens. These are based on two general and interrelated principles: conversation management, which dictates how the communication should correctly and effectively be conveyed, and a more aesthetic principle, related to engaging and immersive experiences, for instance borrowing techniques from cinematic or TV grammars.

Multi-screen Video Composition Formats

Audiovisual composition refers to the management of media objects (audio and video) within the physical environment available to the user (screens, speakers). In particular, the role of the composition process is to render a set of multimedia objects (real-time and pre-recorded), to control their position, and to do this within an appropriate timeframe. In Vconect we have already identified a number of requirements for audiovisual composition. These requirements can be divided into four main clusters: audiovisual elements (what to render), spatial composition (where to render it), temporal composition (when to render it), and infrastructural requirements.

Feedback from initial experimentation suggests that in addition to multiple cameras, the performance case may benefit from streaming to multiple screens located beyond the regular front-panel we are familiar with up until now.

Composition strategies will be developed through iterations with performers and audience members to uncover the optimum presentation and feedback mechanisms for both performers and audiences. Our aim is to refine results that are applicable across locations such as studios, theatres, classrooms and village halls.

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The Virtual Microphone

Vconect partner Fraunhofer Institute is exploring a new way of tackling the capture of reliable directional audio in dynamic situations in larger rooms. Existing state-of-the-art methods for spatial audio recording are limited to acoustic images for people in fixed positions and these positions are constrained by the physical location of microphone. Our aim in Vconect is to provide the functionality, of allowing for consistent audio capture, thereby enabling a more natural communication experience. For example, a broad spatial acoustic image could accompany a wide-angle camera view, while a narrower, more zoomed-in acoustic image could better support a close-up view. The virtual microphone (VM) concept relies on the use of two or more microphone arrays, for which the direction of arrival of the sound events can be estimated in terms of both time and frequency. Based on the information gathered by the real microphone arrays and the knowledge of their relative positions, the virtual microphone will allow a computer to virtually place a microphone at any point in the room.

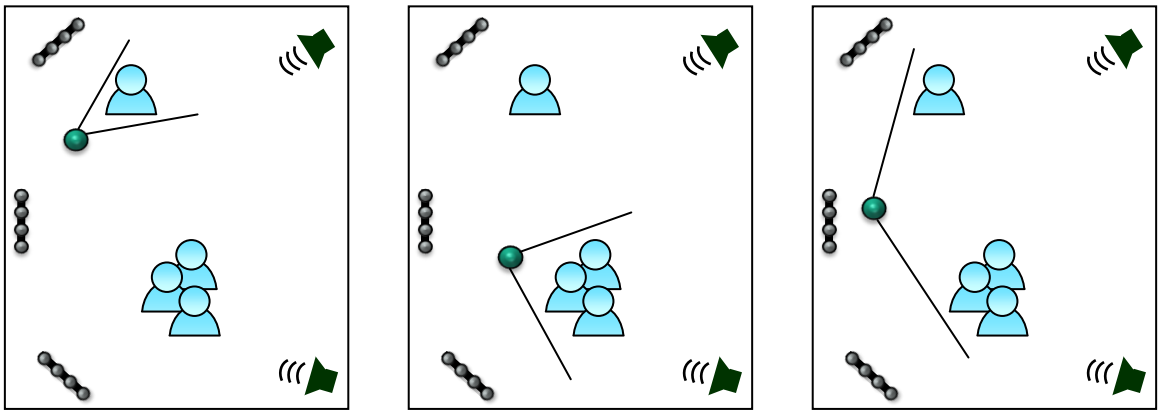

Figure 6 Orchestration will be able choose a broader or narrower sound image

The Service Aware Network

One main goal of the Vconect project is the optimisation of the quality of experience (QoE) for users. Audio-visual communication between large groups of users using the Vconect platform should be a satisfying experience. This imposes a number of requirements on the infrastructure (it should work reliably), on the user experience (immersive look and feel), and on the functionality (high-quality and adjustable audio-visual quality). In particular, the Vconect platform needs to match variable network properties to QoE as well as to optimise the use of the network resources. This also raises the need for monitoring parameters that have an influence on the QoE and measuring them in real-time. These measurements should happen within the system components and at the client endpoints. Some of the parameters are video delay, audio delay, image quality, client capabilities, and component/client performance.

The Vconect consortium, led by expertise from BT and CWI, is exploring the concept of a Service Aware network to attempt to enable this optimisation of the user experience in the real world Internet of different bandwidths, latencies and capacities.

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Vconect at conferences

Partners from the Vconect consortium have already made a significant impact in recent conferences and workshops. Papers at conferences have included:

'When social bots attack: Modelling susceptibility of users in online social networks', a paper by Claudia Wagner, from Vconect partner JRS in the proceedings of Making Sense of Microposts at the **World Wide Conference 2012**.

'Synchronisation Techniques in Distributed Multimedia Presentation' by Dick Bulterman and Shahab Ud Din from CWI in the **Fourth International Conferences on Advances in Multimedia (MMEDIA 2012)**.

'A Rule Based Virtual Director for Enhancing Group Communication' by Rene Kaiser, Manolis Falelakis, Marian Ursu and Wolfgang Weiss from Joanneum Research and Goldsmiths College in the proceedings of the 2012 International Workshop on Emerging Multimedia Systems and Applications, in conjunction with **ICME 2012**.

Other notable contributions were by Pablo Cesar from CWI who gave a tutorial at **ACM SIGCHI Conference on Human Factors in Computing Systems**, 2012 in Austin, Texas on the subject of 'Social Interaction Design for Online Video and television' and also an invited talk on 'Socially Aware Multimedia' at a **workshop on Next Generation Multimedia Research and Development at New York Abu Dhabi University**.

The work of the Vconect consortium featured in 'Video Communication for Networked Communities: Challenges and Opportunities', which will be presented at the International Conference on **Intelligence in Next Generation Networks (ICIN 2012)**, 8-11 October 2012 in Berlin, Germany.

We look forward to a workshop given by Vconect partners on Socially Aware Multimedia at **ACM Multimedia 2012** in Nara, Japan. We hope to see you there.

About Vconect

Vconect is a "Specific Targeted Research Project" (STREP) of the ICT (Information and Communications Technologies) Work Programme under the European Community's 7th Framework Programme (FP7). It addresses objective 1.5 ("Networked Media") under challenge 1 ("Pervasive and Trusted Network and Service Infrastructures").

The project is partly funded by the European Commission. Its overall budget is about 5.5 million euro.

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