

# Multimedia Communications in Remote Interviews

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## Abstract

*In this paper, we present an application system, TRIUMF that is purposely designed for recruitment interviews conducted remotely through video-conferencing. In particular, we examine how multimedia communications can be utilized to overcome difficulties currently associated with remote interviews, such as the inadequate visual information and the lack of physical contact. We also describe our approach to the design of multimedia user interfaces in TRIUMF, which is to be used by a wide-range of users of varying IT knowledge and experience.*

## 1. Introduction

For the last few years, video-conferencing has become a common communication tool for activities such as meetings among distance collaborators, distance learning, and remote clinical diagnoses. In particular employers have discovered video-conferencing as a cost-effective means to conduct recruitment interviews, and benefited from noticeable saving in both travelling time and costs. Although this practice is not yet as common as face-to-face interviews, it is believed that it will become a norm in the near future because of its obvious economic advantages.

Questions start to arise as to whether or not the quality of remote interviews via video-conferencing is comparable to face-to-face interviews [1]. Most general-purpose video-conferencing systems provide only a head and shoulders view, and simple data exchange software such as a whiteboard. This is far from enough to provide a feeling of sharing a social space during remote communication [2-4].

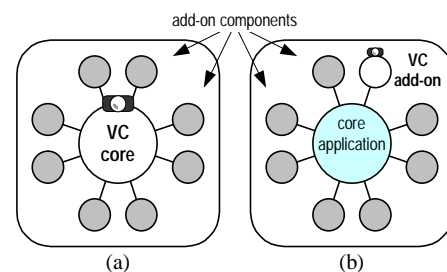
The main technical concerns about remote interviews via video-conferencing include a lack of immersion [5] due to the inability to see the world around the remote person and the unrealistic feeling of the social space, a lack of direct physical contact, such as handshakes, which is an important part of the interview process for reducing tension, and a lack of purposely designed hardware and software environments that support interview management as well as multimedia communication during interviews.

TRIUMF (Technology based Remote Interviews Under a Multimedia Framework) is an integrated environment for remote recruitment interviews, and it was purposely designed to overcome the technical problems given above through the effective use of multimedia communications.

## 2. Related Work

Remote recruitment interview is not the only application area where general purpose video-conferencing systems have been found inadequate. There is a considerable amount of research into developing software environments with facilities including application control [6], meeting history management [7], multimedia presentation, and collaborative visualization [8].

From these applications, we can observe in abstract two types of software architectures as illustrated in Figure 1. A conference management system is a typical example of model (a), which has video-conferencing as its core component, and other multimedia tools (e.g. history management) as add-on components. However, most other applications fall into model (b), where video-conferencing plays a supporting role. From the perspective of users, in model (a), video-conferencing is likely to be active throughout the running of an application, while, in model (b), video-conferencing is usually activated only when such communication is necessary. From the perspective of software developers, model (a) normally requires complicated interfaces between video-conferencing component with other multimedia components, while model (b) often requires a simple link from the core application to the video-conferencing component for connection activation and deactivation.



**Figure 1.** Abstract models of software with video-conferencing (VC) functionality.

Video conferencing is the core function of remote recruitment interviews. A purposely designed environment thereby has to be based on model (a).

Results of human factors research into the effectiveness of multimedia communications in general, and tele-/video-conferencing in particular, became available recently to researchers and software developers in the field. Those

research results which influenced this project include the comparison between face-to-face meetings and video-conferencing [1, 9], the study of quality of services and its effects in telepresence [2-5], and human factors in the design of multimedia interfaces [10].

Existing projects that researched into life size displays, multiple camera views [11, 12] and the effective use of video clips [13] respectively have drawn a parallel with some of our development.

### 3. TRIUMF — An Overview

As mentioned in Section 1, face-to-face interviews are conducted through multiple intermediaries. In order to provide an adequate simulation of these intermediaries in a remote recruitment interview, the communication system must be under a multimedia and multi-sensory framework. It should utilize the technology to provide an immersive video-conferencing environment, while facilitating a range of computer-assisted interview techniques.

TRIUMF (Technology based Remote Interviews Under a Multimedia Framework) is special purpose system for remote multimedia interviews. It is designed to be housed in large-to-medium sized companies, universities and colleges, government employment services, recruitment agencies and other reasonably sized organizations. Its main objective is to provide an environment as an adequate alternative to face-to-face. In such an environment, interviewers should be able to obtain a sufficient amount of multimedia information in order to make fair and correct selection decisions, while interviewees should not feel intimidated by the technology, or be prevented from giving their best presentation during remote interviews.

#### 3.1 Hardware Configurations

TRIUMF provides three typical configurations, namely *basic*, *standard*, and *deluxe* (Figure 2), designed to suit organizations with varying operational requirements and financial capacity. The authors previous paper [14] detailed hardware devices in each configuration, and an illustration of the deluxe room configuration is shown in Figure 3.

Large video screens used allow the displaying of the remote participant in near life size, removing one of the most obvious artifacts in desktop video conferencing. By allowing participants to sit further away from the screen, we enhance their feeling of sharing a social space in telepresence.

We utilise auto head tracking cameras (Sony D31) to resolve the static head and shoulder view normally associated with videoconferencing. Additional cameras positioned at the corners of the room also present a participant with a full view of the opposite interview room, hence providing a better simulation of human vision. We also utilize a video mixer/splitter, this allows us to view many of these views simultaneously.

We have carefully designed the rooms so that they can easily be changed from an interviewee room to an

interviewer room and vice versa by moving around the furniture. An organization therefore needs to allocate just one room and purchase one set of equipment for remote interviews.



Figure 2. Interviewing with the Deluxe Configuration.

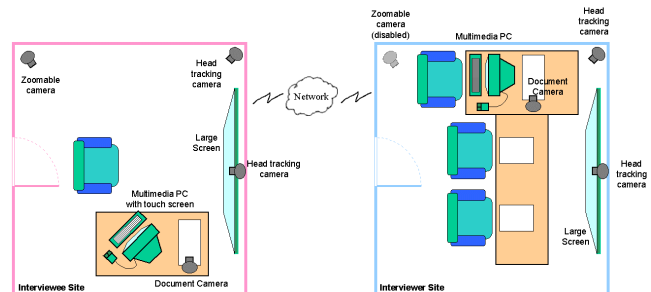


Figure 3. Room Configurations.

#### 3.2 TRIUMF Tools

The primary use of TRIUMF is to assist interviewers in managing activities during remote interviews. These activities range from initial introduction to final data recording, and include many types of controls such as modifying camera views and holding an online test. TRIUMF divides its functionality into three groups of tools, namely *interview*, *system*, and *data management*.

Interview management tools are used by interviewers to manage an interview session. Tools in this group include *auto-cue management*, *time management*, *relaxation gadgets*, *video case studies* and *application sharing*.

System management tools are mainly used to assist in the management of TRIUMF hardware and the customization of the system. Most tools are designed to be used by technicians or technically experienced interviewers. Controls include *camera controls*, *multi-view* and *display controls*, and *audio controls*.

Data management is a key element in an interview process. Although it is likely that most communication during the main interview session is via visual and auditory media, there are often other activities involving data

exchanges, such as filling a form and having a technical or psychometric test. Tools for supporting these activities include a *personnel database*, *online form filling*, and *online candidate testing*.

#### 4. Visual and Audio Communications

It is unquestionable that visual and auditory communications are the two most important elements in remote multimedia interviews. Humans receive about 70% of all sensory input from vision [15]. However, due to the current technological limits, the video medium in telepresence conveys only a limited subset of visual information which one would receive in physical presence [5].

From our own studies, we have identified that the usage of a small video display screen leads to a remote and artificial feeling. The close sitting position due to the small display sometimes causes an uneasy and timid feeling, and the lack of awareness of surroundings beyond the head/shoulder view often results in an inadequate and insecure feeling during interviews. The simple step taken to overcome these problems was to incorporate a large video screen to close the gap between telepresence and physical presence. The near life-size display enables participants to sit away from the display at a distance that is considered to be natural in face-to-face interviews. Both interviewees and interviewers act more at ease in their communications. This further confirms the findings of previous research in this aspect [16, 5].

The introduction of multiple camera views (Figure 4) significantly improves the sense of shared space between participants. This enables interviewers to make better observations of a candidate. Such observations can give



Figure 4. Multiple Camera Views.

interviewers a sense of control over the entire environment and they can sometimes be critical to interviewers' selection decision. Meanwhile, being able to see all those who are listening provides a greater sense of security.

Video is a very powerful medium and an excellent storyteller. Often in a face-to-face interview, an interviewee is presented with a scenario, and is asked what he/she should/would do if such a situation arises. Modern practice in human resource management requires an interviewer to present a scenario to each candidate in a consistent manner in order to prevent discrepancy in the presentation that may lead to any misunderstanding and unfairness. By utilizing the presence of multimedia communications, TRIUMF has introduced Video Case Studies as a computer-assisted interview technique as shown in Figure 5. Interviewers are provided a collection of video clips including many

commonly used scenarios, such as technical difficulties, an awkward customer, professional ethics, reporting a colleague, long distance commuting, and so on.

#### 5. Data Communication

Although tools are currently available for the participants of a video-conference to exchange data and share an application [20, 21], it is impossible to expect interviewers and interviewees to juggle these tools during a formal recruitment interview, not mentioning that many of them can be computer-illiterate. TRIUMF has been designed to accommodate a variety of data communication as described in Section 3.2, the development has been focused on the communication between interviewers and interviewees, that is the tools for form filling and online tests.

#### 6. Pseudo Physical Communication

It is common that interviewees are nervous in face-to-face interviews, especially during the first few minutes when they walk into a unfamiliar room to meet interviewers. The first task of an interviewer is always to give an interviewee a warm welcome and to reduce the tension. This usually comprises of handshakes followed by a short informal chat. Experienced interviewers sometimes use physical actions such as moving a small piece of furniture to put interviewees more at ease. Remote interviews may possibly make the entire process even more intimidating to many candidates. TRIUMF provides a number of activities to compensate for this disadvantage. For example, at the beginning of an interview session, an interviewer may activate one relaxation gadget that shows a picture of a huge clown on the interviewee's computer screen, the clown then makes some light-hearted comment to help settle the interviewee's nerves.

#### 7. Multimedia User Interfaces

The user interfaces of computer software have been constantly changing their faces during the past decade. There are a range of approaches to the design of multimedia user interfaces [10], many of which promoted one of a few design metaphors.

As discussed in Section 3, TRIUMF features fairly complicated hardware configurations, a range of software tools for interview, system and data management, and a software architecture supported by a number of development environments. Our first design principle is to hide the complexity from users.

The interviewees are given a very simple interface



Figure 5. Video case studies.

with very few options. All facilities for system management and data management are completely hidden and are only accessible by a trained user. Interviewers, system managers, and data managers share an interface with access to their respective sections through three large buttons that are always visible in the top left corner of the screen. The interviewers sub-interface consists of pictogram buttons to represent the underlying functions, these pictograms are also supported by some short descriptive text. For example, for time management, you would click on the clock icon (Figure 6). The interface is completely customisable and different function buttons can be added, removed, or repositioned on the “desktop” [17] to suit the interviewers preference - much like the desktop environment found on many home computers today.

On entering the system management or data management sub-interfaces, the background will change hue to signify the separate section. The style of the interface will also change. System managers are presented with a tool-based functional interface, much like the windows “system” control in the control panel. Data managers are presented with a web-like interface.



**Figure 6.** Top-level desktop interface for interviewers.

## 8. Conclusions

We have presented a hardware and software environment that was purposely built for conducting recruitment interviews via video-conferencing and discussed the shortcomings of using general-purpose systems. Our experience has led us to believe that it is important to improve visual communication, particularly in the forms of display size and multiple views, it also necessary to utilize data communication for activities such as form filling.

The human factors for the key features of TRIUMF is being investigated through a comprehensive cognitive study conducted mainly by our colleagues in Psychology. We will also be evaluating the practical feasibility of running TRIUMF in real world with the help of our colleagues in the Careers Center at Swansea.

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