

Media Spaces for Collaborative Tele-health

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Abstract. This poster presents on-going work on a collaborative tele-health application. Our aim is to seamlessly join two remote physical spaces to form one media space in such a way that a complex tele-health application can function across the boundary. Multiple fixed cameras, microphones, displays and speakers, together with pointing and drawing systems, provide the communications and shared frames of reference between the two sites. Key requirements, obtained from field observations, include support for discussion between doctor and patient, physical patient examination under the doctor's direction, and social awareness. These requirements guided the system's design and the initial laboratory experiments. A five-week hospital pilot study is planned for later in 2007. The focus of this poster is on the process of designing and evaluating an application-focused media space.

Application requirements

The collaborative tele-health scenario is supporting surgeons at a major children's hospital to conduct remote post-operative consultations with their patients and parents, with the help of a medically trained clinic assistant located with the patient. Observations of hospital clinics were conducted. These observations suggest that the system must support: direct doctor/patient/parent discussions; the doctor's observations of the patient's mobility and function as he or she walks, runs, talks, laughs and responds to spoken stimuli; actual physical examination of the patient by the clinic assistant under the close guidance of the doctor: multi-way dialogue between participants within each site and between the sites, and social awareness.

Our system design is based on these requirements and is consistent with insights identified in media spaces literature. These include the need to consider the affordances of the particular design of the media space (Gaver 1992), explicit consideration of shared frames of reference and stable reference objects (Heath et al. 2001), providing support for the patients' sense of "place" as a valid hospital clinic embedded in the technology of the media space (Harrison and Dourish

1996) and the need for the actions of each participant to be “publicly available” to all participants (Robertson 2002). Specifically, the technology for guiding the clinic assistant – pointing/drawing over live video and laser pointing/drawing into the clinic workspace – has been implemented in a way that makes the guidance actions and assistant’s responses “publicly available” to the participants in both the local and remote site. To our knowledge the resulting media space represents a first in integrating all these requirements.

Evaluation

We are conducting a staged evaluation to ensure that requirements are highly likely to be met when the system is placed in the application setting. As part of this staged evaluation the underlying media spaces system and the collaborative guidance technologies have been evaluated in a laboratory setting. The purpose of these studies was to observe aspects of the system in use in a non-clinical setting and test them against the observed requirements. These observations led to design improvements and confidence in the system’s ability to support the clinical requirements during a hospital-based pilot study. This study is planned for later in 2007 at the Royal Childrens Hospital, Melbourne. Patients will receive a tele-health consultation followed by a face-to-face consultation, both conducted at the hospital. We will assess the levels of patient and clinician acceptance of our tele-health approach which will allow us to determine the level at which the application requirements have been met. The order of the consultations (tele-health then face-to-face) was chosen to maximize the value of the inquiry into the performance of the tele-health system, with the clinician seeing the patient afresh as they would in a true remote deployment situation. The results of this pilot study will feed into subsequent deployment and more formal evaluation decisions.

References

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