The Impact of Non-Verbal Communication in Virtual-Environment-Based Teamwork Training

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Aim

To present a simple method to use a webcam to enhance nonverbal communication in virtual-environment-based teamwork training.

Background

Over the last decade, healthcare profession training has been enriched by educational technology such as virtual-reality simulators for skills training and mannequins for team training. More recently, there has been the development of several metaverses that are now being used for virtual-environment-based teamwork simulations. This type of simulation lends itself to networking, allowing participants to participate from remote locations. The significant drawback of training in virtual worlds is that the avatars, in-world representatives of the participants, are capable of very limited non-verbal communication. Of note there is no facial expression, gaze control or head movement. Our thesis is that enhanced non-verbal communication will improve training outcomes.

Methods

We have developed a model of the aspects of non-verbal communication that a simple webcam (Creative Live! Cam Video IM Pro) can capture. This model has been integrated into a program that monitors and evaluates the webcam input. The data
is fed into a simulation based on Valve’s Source Engine that has been modified to mirror the information on the avatar.

**Results**

Initial tests suggest a more realistic and effective communication between users in virtual world simulation. Feedback from medical and other professionals suggests that this approach has significant advantages and potential to enhance team training.

**Conclusions**

Using additional input from a webcam to control the avatar, we have achieved enhanced non-verbal communication. Initial feedback is very positive. The next step is to conduct extended user studies.