Introduction

By subjective assessment, this report investigates the effects of group (or inter-destination) synchronization control in distributed virtual environments where users have a conversation with each other by using avatars constructed by computer graphics (CG) and live voices.

Assessment results show that the fairness among the users can be maintained high under the group synchronization control in net! worked –competitive work.

We also demonstrate that the synchronization quality of net!-worked collaborative work can be improved under the group synchronization control.

Keywords: Distributed virtual environment / Avatar / Voice / Network latency / Fairness / Interactivity / Group synchronization / QoE

Work Description/ Aims/ Methods

This research work deals with two types of work in which three users communicate with each other via a network by using voices and avatars/videos.

This research work subjectively assesses the effects of group synchronization control in the case where we handle avatars in duplex communication by dealing with a name-guessing task like fastest fingers first, which is employed as competitive work and rock-paper-scissors which is done over the network as collaborative work.

Examine how the group synchronization control affects on the Quality of Experience (QoE). Subjective Assessment has not been carried out. We use the Virtual Time Rendering (VTR) algorithm for the intra stream and inter stream synchronisation control. The algorithm dynamically changes the buffering time of the MUs according to the network load.

Results

Assessment results showed that in the name-guessing task like fastest fingers first, the group synchronization control improves the fairness and comprehensive quality while maintaining the interactivity high.

In addition, we made an experiment in which we use videos instead of avatars.

However, by comparison of interactivity between the two cases, we saw that the MOS values of the interactivity in the video case tends to be slightly smaller than that in the avatar case. This is because subjects can raise avatars’ hands instantly, but it takes some time for them to move hands actually.

Also, we found that in the networked rock-paper-scissors, the group synchronization quality, interactivity, and comprehensive quality of the caller are improved by the group synchronization control.

Conclusions

This joint research work examined the effects of group synchronization control by subjective assessment for a name-guessing task like faster fingers first and networked rock-paper and rock-paper-scissors in distributed virtual environments with avatars.

As the next step of our joint research, we plan to enhance the group synchronization control by taking account of the difference of the role in conversations in order to alleviate the deterioration in the QoE of the receiver in networked rock-paper-scissors.

In addition, we will make the experiment for other competitive work and collaborative work.

References


Joint Published Research Work

Kazuki Hosoya, Yutaka Iishibashi, Shinji Sugawara and Kostas E. Psannis, QoE Assessment of Group Synchronization Control in Distributed Virtual Environments with Avatars, IEICE Conference On Communications Quality (CQ2008), Japan, pp.27-32, June 2008 
†† Joint Research-Award, July 2009, from IEICE

ΔΙΑΚΡΙΣΕΙΣ – ΒΡΑΒΕΥΣΕΙΣ

Institute of Electronics, Information and Communication Engineers (IEICE), established 1917, Technical Committee on Communication Quality, 2009, Japan: award for studies, certificate of merit.