Skill Transmission by Using Parasitic Humanoid System

* Yuki HASHIMOTO, Daisuke KONDO, Tomoko YONEMURA, Hiroyuki IIZUKA, Hideyuki ANDO and Taro MAEDA

Osaka University / JST CREST

ABSTRACT

We have proposed a Parasitic Humanoid (PH) system where two distant people can share their views, audio and tactile sensation by mixing or exchanging them by our devices. The users can share what the other user is seeing, hearing, and touching. Our goal is to transmit non-verbal skills from skilled person to the non-skilled person by using PH system. To realize this goal, we improved this system. The system has the feature of a light weight, a wide viewing angle, stand-alone and a calibration of intraocular distance is unnecessary. These features can make more efficient of skill training and expand sphere of activity.

KEYWORDS: view sharing, skill training, parasitic humanoid, wearable system

1 PARASITIC HUMANOID SYSTEM

By extending the robot-human telexistence[1] technology to human-human situation, we are developing an environment where a skilled person, who actually exists at a different place, can work with high quality on the ground instead of non-skilled person. The skilled person feels as if he exists at the place and work there. The non-skilled person can show high-quality performances with the skilled person's help. In order to realize such a telexistence environment in human interactions, we are developing remote communication technologies exploiting sense-motion sharing is. In this project, we have developed the system to share the first person perspectives, environmental sound and touch feeling between remote two people[2]. Based on previous works, we developed a new PH system for improvement of effect and expansion of application (Figure 1).

The new PH system has three advantages. One is light weight. Weight of the system is drastically lighter than established one (established one = about 32kg, new one=about1.5kg). The second is stand-alone system. In this system, the user can wear all components. In addition, there is a battery to operate without external power supply. Therefore, it is possible to extend user's behavior range. The third is wide field of vision. We developed a new video see-through HMD (VST-HMD) that the viewpoint of eyes and display continues suiting without adjustment because of sticking displays on each eye. This design effects a wide field of binocular vision at horizontal axis; about 50° (horizontal) x 24° (vertical).

2 DEMONSTRATION

We have tried to use our system for skill transmission about the following for several tasks [3][4] in real time. And we are also trying to skill transmission by represent a recorded data of expert. For example, a user learns about Cardiopulmonary resuscitation (CPR) by reliving of expert's movement in first person stand point. The demo allows some remote cooperating works and reliving of behavior of an expert by using our system.
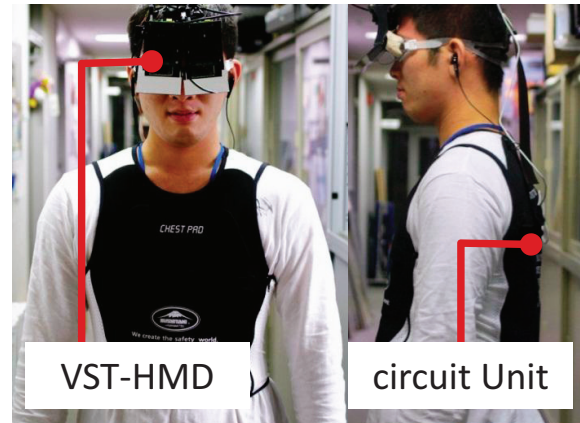
*email:{y.hashimoto, kondo, yonemura, iizuka, hide, t_maeda}@ist.osaka-u.ac.jp

Figure 1. Implementation of parasitic humanoid system
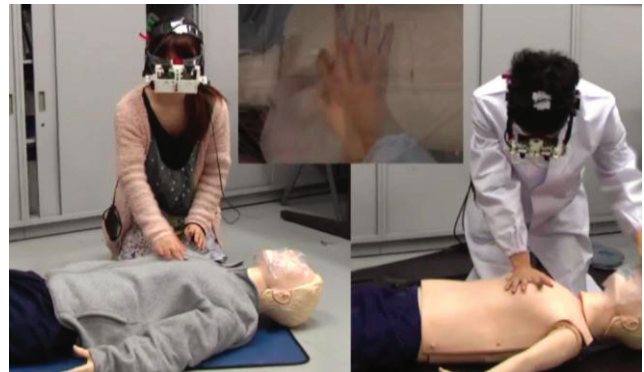
Figure 2. Cardiopulmonary resuscitation

3 ACKNOWLEDGMENTS

REFERENCES

[1] Susumu Tachi: Tele-existence - Toward Virtual Existence in Real and/or Virtual Worlds, Proceedings of the International Conference on Artificial Reality and Tele-existence (ICAT '91), pp.85-94, 1991.

[2] T. Maeda, H. Ando, H. Iizuka, T. Yonemura, D. Kondo and M. Niwa : Parasitic Humanoid: The Wearable Robotics as a Behavioral Assist Interface like Oneness between Horse and Rider, 3rd Augmented Human International Conference, 2011.

[3] K. Kurosaki, H. Kawasaki, D. Kondo, H. Iizuka, H. Ando and T. Maeda : Skill Transmission for Hand Positioning Task through View-sharing System, 3rd Augmented Human International Conference, 2011.

[4] H. Kawasaki, H. Iizuka, S. Okamoto, H. Ando, T. Maeda : Collaboration and Skill Transmission by First-person Perspective View Sharing System, 19th IEEE International Symposium in Robot and Human Interactive Communication, 2010.