RacketAvatar that Expresses Intention of Avatar and User

Katsutoshi Masai, Yuta Sugiura, Michita Imai, Maki Sugimoto
Keio University
Yokohama City, Kanagawa, Japan
(masai, sugiura)@imlab.ics.keio.ac.jp,
michita@ailab.ics.keio.ac.jp,sugimoto@imlab.ics.keio.ac.jp

Figure 1: Left: The avatar expresses the intention of the player (Provocation), Middle: The avatar expresses emotions through the motion, Right: The avatar has embedded servo motors.

ABSTRACT

This paper provides a video prototype about a RacketAvatar that expresses the intention through the motion. The avatar can have two characters, the racket itself and a user who has the one. This ambiguous character can create a new relationship between a human and a robot avatar. The merit of animating a racket the user has is that it can communicate through haptic feedback in addition to visual feedback.

Keywords

Augmented Sports; Sports Interaction; RacketAvatar;

1. RACKETAVATAR

Sports includes various emotional scenes such as a win, a new record, and an accomplishment. In these scenes, a number of sports players express themselves through the play, by holding a victory pose and/or raising a cry of triumph and so on. Behind the scenes, players practice hard and the pieces of equipment (a ball, racket, shoes) they used may act as if a part of their body. Those pieces of equipment may have special meaning to them. Therefore, we think there is a good potential if those can communicate and express the player's and its intention.

We designed a RacketAvatar that can express with the motion of the servo motors embedded in the racket itself (see Figure 1). The novelty of the concept is that the presence of the avatar is changeable. It can be not only a part of the user but also an anthropomorphized racket like a "display robot" [1]. Therefore, it can create a new relationship between a human and an avatar. In addition, it enables subtle communication with a user through a haptic feedback of the servo motion. A haptic feedback can effect unconscious mind, which enriches the communication. Moreover, it can enhance the expression of the player and these expressions of the avatar can be shared to other rackets that an audience has. It may make the sports watching experience more engaging.

In the video, we explored how to express some of basic emotions and intentions through the motion of the racket. We show a simple communication (a nod), and a basic emotional expression (smile, sadness, anger, and surprise). In addition, we show how our RacketAvatar can be used in a game scenario such as provocation aiming at distracting an opponent's attention. We designed each motion based on the impression of human emotions and activities.

A RacketAvatar consists of a racket surface, a 3d printed handle where a microcontroller (Arduino micro) is inside, and two servo motors (KRS-3204 ICS) for changing the pitch and roll angles between the racket surface and the handle. As there are no sensors, we manually controlled the motion of the racket in the video from a laptop. We used external power supply (five AA batteries) for the servo motors.

HRI '17 Companion, March 06-09, 2017, Vienna, Austria
ACM978-1-4503-4885-0/17/03.
http://dx.doi.org/10.1145/ 3029798.3036657

2. ACKNOWLEDGMENTS

This work was supported by JSPS KAKENHI Grant Number 16H01741.

3. REFERENCES

[1] H. Osawa, J. Mukai, and M. Imai. 2007. "Display Robot" - Interaction between Humans and Anthropomorphized Objects. In RO-MAN 2007 - The 16th IEEE International Symposium on Robot and Human Interactive Communication. 451–456. DOI: http://dx.doi.org/10.1109/ROMAN.2007.4415126