Heart-to-Heart Communication

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Abstract: Human heartbeat is very important signal and regulated by autonomic nervous activity. Therefore, we construct an interactive computer graphics (CG) system using the signal of electrocardiogram (ECG). Multiple subjects participate in this artwork. Subjects' ECG are continuously monitored and transmitted to the personal computer for generating/regulating CG. Graphical creature that corresponds to each participant is generated by Growth Model and driven by participants' heartbeats. In this artwork, we aim to present new types of communication by graphical creature that reflects participant's autonomic nervous activity..

Keywords: Interactive art, Heartbeat, Growth Model

1. Introduction

Heart rate variability is known as one of the vital signs and regulated by autonomic nervous activity. Therefore, it is also affected by higher brain function such as emotion and thought. In addition, heart rate variability has very complex characteristics and it is important problem including physics to elucidate how these complex characteristics are generated and maintained [Kotani05]. In this artwork, subjects' heart rate variability, which contains important information about human internal condition, is extracted, and graphical creatures are driven by it in real time.

2. The configuration of the artwork

Fig. 1 shows the configuration of this artwork. The participants are asked to put disposable electrodes to neck and both hands for monitoring electrocardiogram (ECG). Also, they are asked to grasp (or put somewhere) thermoistor for monitoring body temperature. These variables are continuously monitored and information about heartbeat such as the timing of participants' heartbeat and inter-beat intervals, are calculated in addition to fluctuations of thermistor. Here, Growth Model is used as graphical creature that corresponds to each participant. Then, it is driven by extracted variables and behaves as if it were given life by them. If participants change their autonomic nervous activities, the effect appears to their creature in real time. In this artwork, we also aim to present new types of communication by graphical creature that reflects participant's autonomic nervous activity (Fig. 2).

Acknowledgement

References

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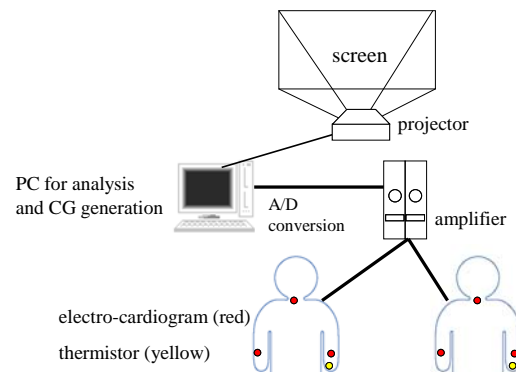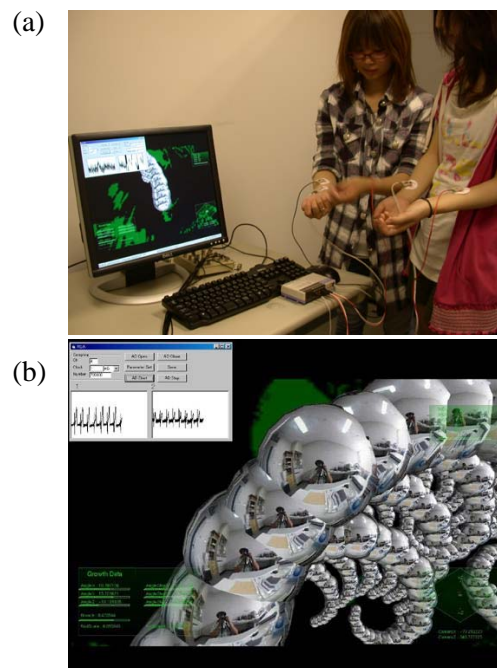
Figure 1:The configuration of this artwork.

Figure 2:Computer graphics that are driven by subjects' heartbeat. The window at upper left of the display shows the monitored EEG signals.