

The Empa Talk: A Physiological Data Incorporated Human-Computer Interactions

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Motivation

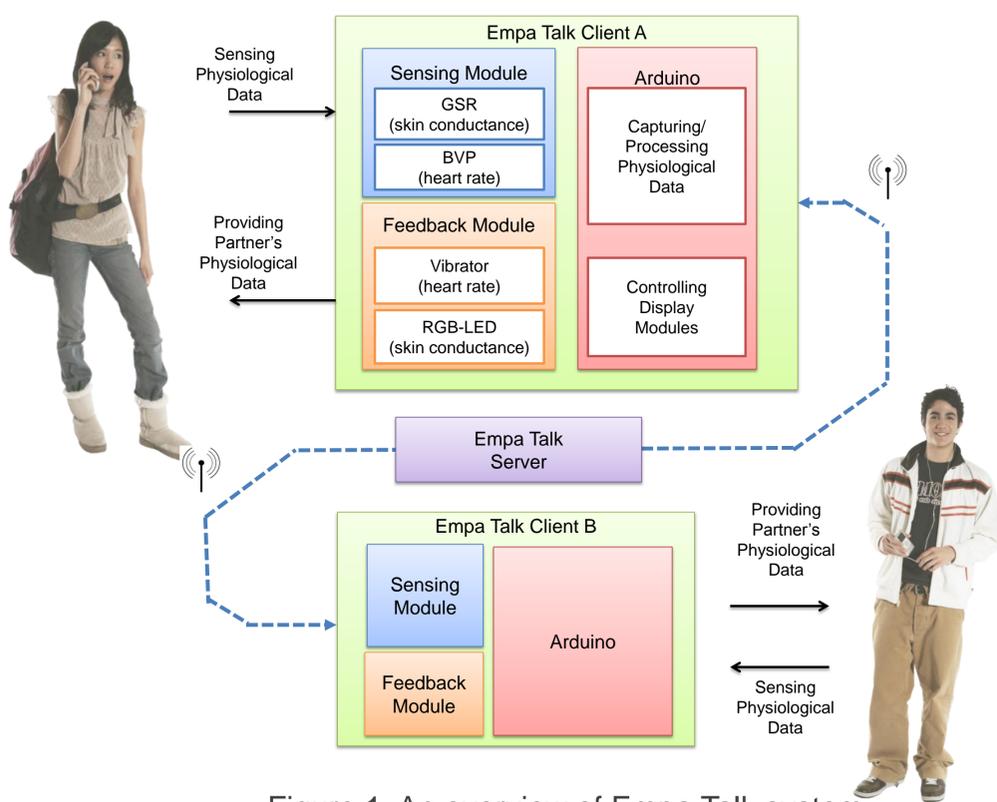
- ❖ To enhance the interactivity between the human user and HCI systems by incorporating human bio data
- ❖ To provide additional modalities in HCI systems, especially for the video chat systems

We Propose The Empa Talk

- ❖ A human physiology incorporated video chat system
- ❖ Enables the user perceive the partner's emotional status while video chatting
- ❖ Physiological data include heart rate and skin conductance
- ❖ With the physiological signals, you will be able to notice the partner's emotional change and to respond to them in a proper way. Here, we present a prototype of Empa Talk and evaluate its usefulness by small-size user study.

Proof of a Concept

- ❖ A wearable interface based on a pair of bracelets
- ❖ An Arduino embedded PC with a blood volume pulse (BVP) and a galvanic skin response (GSR)
- ❖ TCP/IP based communication



Empa Talk Hardware

- ❖ Arduino Uno, BVP sensor, GSR sensor, RGB LED (as skin conductance display), vibrator (as heart rate display)

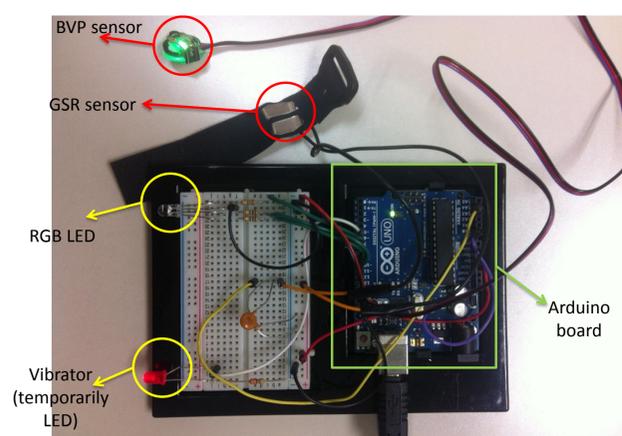
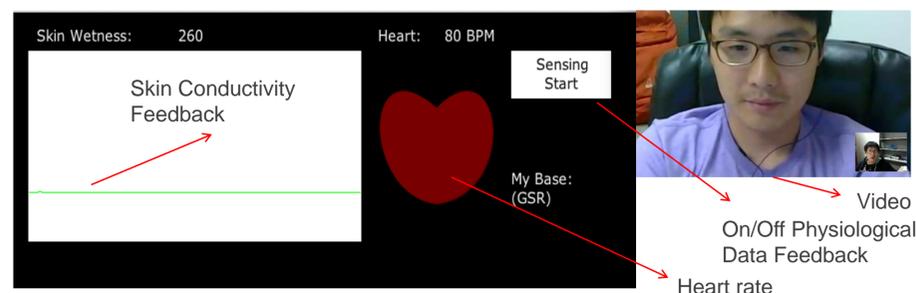


Figure 2. Empa Talk Prototype (Hardware)

Empa Talk User Interface

- ❖ Provides a heart rate, a pulsate, a level of skin conductivity, and a video



Evaluation

- ❖ Conducted a preliminary user study with five participants
- ❖ Within subjects design – with/without Empa Talk
- ❖ Experienced first the Truth or Lie game
- ❖ Assessed the effectiveness according to the four criteria: Enjoyment, Engagement, Presence, and Workload
- ❖ Participants enjoyed more with Empa Talk than without Empa Talk (Figure 4 (a))
- ❖ Participants produce higher results in all criteria as positive contribution (Figure 4 (b)).

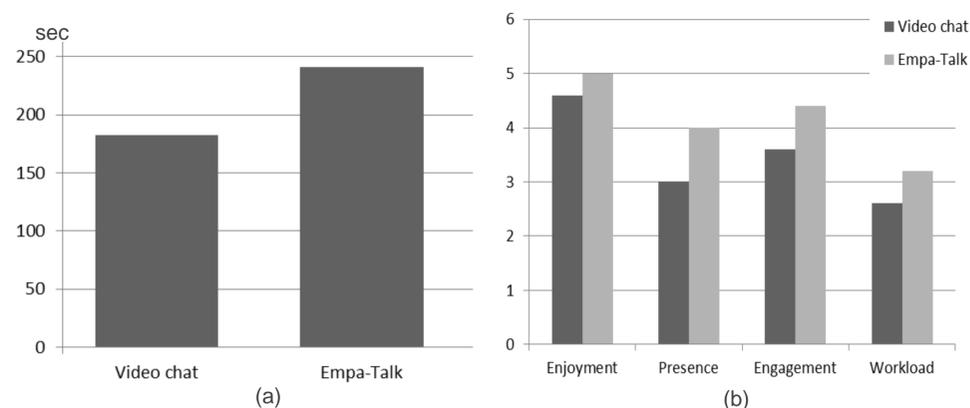


Figure 4. Evaluation Results: (a) time spent used in chatting, (b) User experience based on the four categories

Conclusion and Future Work

- ❖ Proposed an approach incorporating human physiological data into an HCI system design
- ❖ Showed proof of a concept – Empa Talk, a video chat system conveying human bio feedback
- ❖ A preliminary study showed that incorporating human bio data into a video chat system affects user experience positively
- ❖ Embedding human physiological data in HCI systems could improve the quality of human-computer interactivity
- ❖ Two investigations have been planned on how physiological response affects human communications and identifying the meaning of each physiological response in regards to human emotions