UNIVERSITÄT AUGSBURG
Universitätsbibliothek

OPEN ACCESS
OPUS AUGSBURG

TangibleHeart - enabling critical and shared reflections of heart behaviors

Ilhan Aslan, Elisabeth André

Angaben zur Veröffentlichung / Publication details:

Aslan, Ilhan, and Elisabeth André. 2017. "TangibleHeart - enabling critical and shared reflections of heart behaviors." In *Proceedings of the 31st International BCS Human Computer Interaction Conference (HCI 2017)(HCI), 3-7 July 2017, Sunderland, UK*. BCS Learning & Development. https://doi.org/10.14236/ewic/hci2017.62.

Nutzungsbedingungen / Terms of use:

CC BY 4.0

Dieses Dokument wird unter folgenden Bedingungen zur Verfügung gestellt: / This document is made available under these conditions:
CC-BY 4.0: Creative Commons: Namensnennung
Weitere Informationen finden Sie unter: / For more information see:
https://creativecommons.org/licenses/by/4.0/deed.de

http://dx.doi.org/10.14236/ewic/HCI2017.62

TangibleHeart - Enabling Critical and Shared Reflections of Heart Behaviors

Ilhan Aslan
Human-Centered Multimedia Lab
Augsburg University
aslan@hcm-lab.de

Elisabeth André
Human-Centered Multimedia Lab
Augsburg University
andre@hcm-lab.de

TangibleHeart is a design that seeks to encourage critical reflection by bringing to the foreground the "ugly and beautiful" ways of how one's own heart works outside explicit awareness. The artefact resembles a real heart in size and behaviour and physically beats in synchrony with the user's real heart. It allows users to experience their own heart's real-time behaviour through physical computing sensors and actuators. It can be held in ones own hands or given to the hands of onlookers for shared and contextual reflection. TangibleHeart aims to trigger a variety of feelings from users and onlookers, ranging from discomfort or uneasiness caused by the realization of the artefact's cruel embodiment to fascination and joy due to the familiar resonance produced by the artefact's behaviour.

1. AUTHOR BIOGRAPHIES

Ilhan Aslan is an interaction designer, engineer and educator. He has studied Computer Science at Saarland University in Germany and conducted his PhD work on movement and embodied interaction design at the Center for Human- Computer Interaction in Salzburg, Austria. He is currently employed as an "Akademischer Rat" at the University of Augsburg, Germany, where he contributes to the scholarly research and teaching at the Human-Centered Multimedia lab. He teaches lectures in Physical Computing, Human-Computer Interaction, and Usability Engineering. His research focus is in understanding the current state of human-artifact relations and to explore future alternatives.

Elisabeth André is a full professor of Computer Science and Founding Chair of Human-Centered Multimedia at Augsburg University in Germany. She has multiple degrees in Computer Science from Saarland University, including a doctorate. Elisabeth André has a long track record in multimodal human-machine interaction, embodied conversational agents, affective computing and social signal processing. She has undertaken very successful interdisciplinary collaborations with psychologists, pedagogues, medical scientists and media artists that have resulted in several award-winning multimo-dal user interfaces, among them pedagogically wellgrounded and empirically validated learning environments for children and young people. She has been elected to several prestigious academies including her latest election to the CHI Academy in 2017.

2. ABOUT THE DESIGN

The design of TangibleHeart is inspired by Soma-estehtics (e.g., Richard Shusterman (2012)) and Positive Computing (i.e., Calvo and Peters (2014)). Both (interdisciplinary) fields encourage the application of technology and design for self-reflection practices. Unlike other physiological data visualizations, TangibleHeart moves (i.e., expands) in synchrony with a user's heartbeat and thus displays the heartbeat in a more direct manner, mapping the original heart behaviour directly to a physical display. The core mechanics are computed using state of the art physical computing tools, such as an Arduino board, a pulse sensor, and a servomotor. The surface of the artefact is covert with latex.

Figure 1 presents the TangibleHeart design in two occasions, including a photo made during a workshop where TangibleHeart was showcased to foster discussion on gender and care issues.

A presenter can showcase TangibleHeart by holding a pulse sensor in one hand, for example between their thumb and index finger as it is done by the person depicted on the right hand side of Figure 1 and offer visitors to hold TangibleHeart in their hands in order to experience the presenters heartbeat. In our experience visitors not only like to experience the presenters heartbeat but also explore their own heart and compare their heart's behaviours with their friends'. Figure 2 illustrates the design process and some decisions made during the crafting process. More details of our research agenda can be found in our previous work (i.e., Aslan et. al (2016)).

© Aslan et al. Published by BCS Learning and Development Ltd.
Proceedings of British HCI 2017 – Digital Make-Believe. Sunderland, UK.

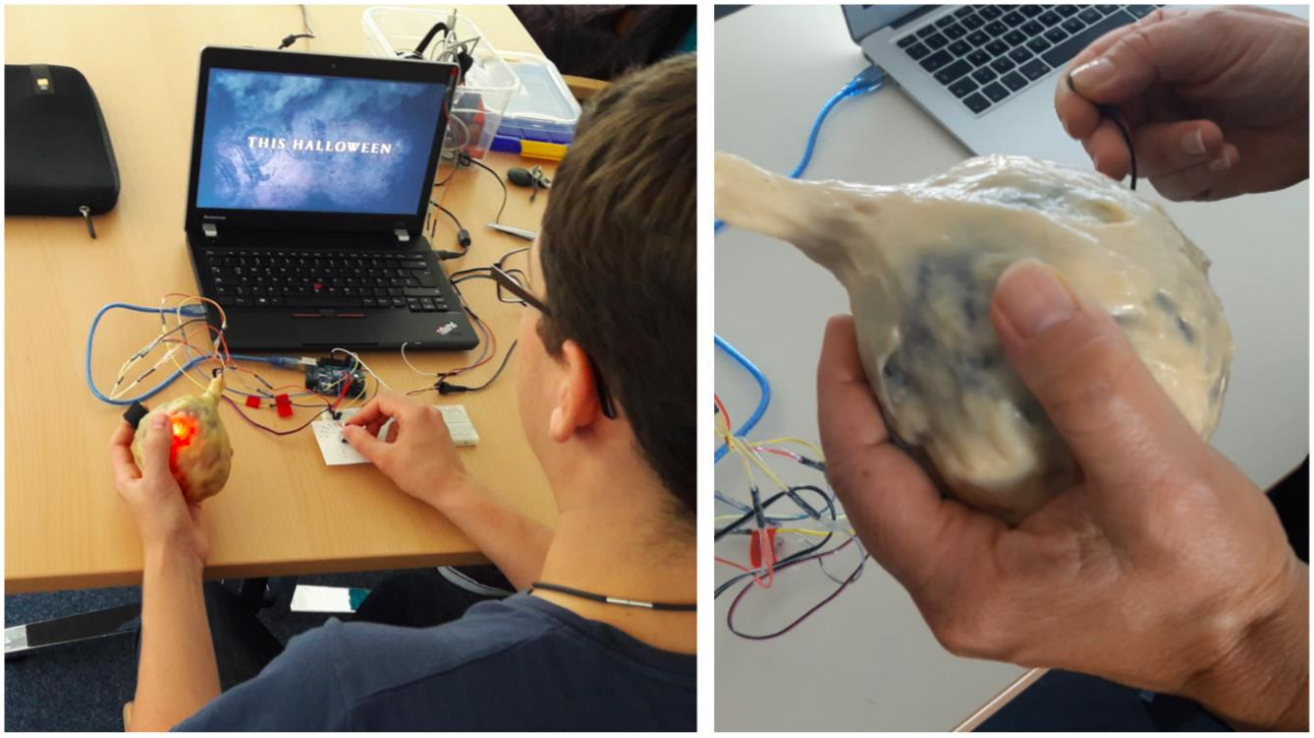

Figure 1: *The TangibleHeart design is depicted in different occasions. On the left hand side TangibleHeart is being used as a tool that provides physiological feedback during watching a movie trailer. On the right hand side TangibleHeart is being showcased during a workshop, addressing gender and care issues.*

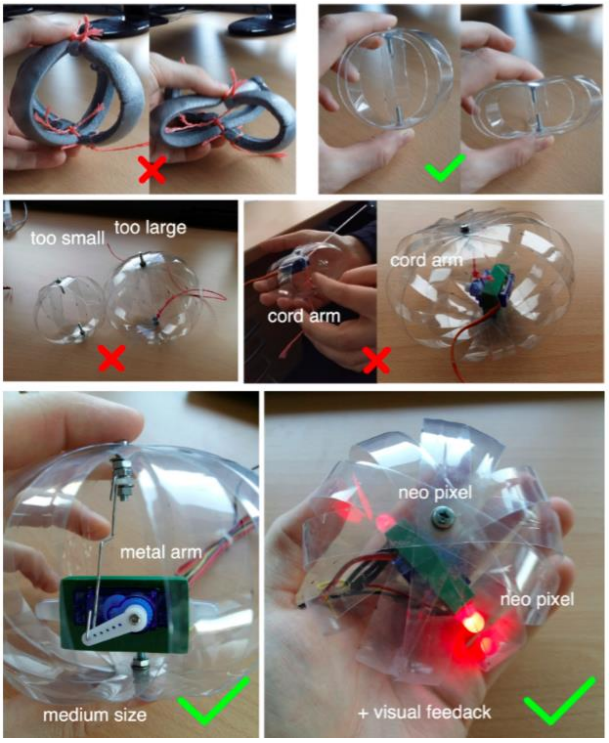

Figure 2: *A glimpse at the design process, illustrating the inner workings of the prototype in earlier design phases and material explorations performed to achieve the "right" feel of a beating heart.*

3. REFERENCES

Aslan, I. and Burkhardt, H. and Kraus, J. and Andre´, E. (2016) Hold My Heart and Breathe with Me: Tangible Somaesthetic Designs. In Proceedings of the 9th Nordic Conference on Human-Computer Interaction (NordiCHI '16). ACM.

Rafael, A. C. and Dorian, P. (2014) Positive computing: Technology for wellbeing and human potential. MIT Press.

Shusterman, R. (2012) Thinking through the body: Essays in somaesthetics. Cambridge University Press.