Design and development of a user centric affective haptic jacket

**Faisal Arafsha · Kazi Masudul Alam ·
Abdulmotaleb El Saddik**

Abstract Affective haptic research is a rapidly growing field. This article intends to improve the existing literature and contribute by involving consumers directly in the design of a smart haptic jacket by adding heat, vibration actuators, and by enhancing portability. The proposed system is designed for six basic emotions: love, joy, surprise, anger, sadness, and fear. Also, it can support several interacts such as a hug, poke, tickle or touch. An online survey was designed, based on literature, and conducted on 92 respondents, who gave their opinion about the physiological impact of emotions and interactions on the human body. The results of this survey assisted in the general design and implementation of the system. 86 % of the volunteers who participated in the final experiment expressed their interest in the system and said that the quality of their multimedia experience was improved through use of the jacket. Detailed design architecture is provided, along with the details of the hardware and software used for the implementation.

Keywords Wearable haptic jacket · Basic emotion · Vibrotactile actuators · Heat actuators · Multimedia feedback

1 Introduction

According to Parrot [14], "Emotions are at the heart of social psychology and are part of what makes social psychology so interesting". Human emotions can be defined as a set of feelings that occur in a certain manner and affect behaviour. Some emotions can be evoked socially by touch, such as a handshake, a hug, or a tickle [9]. Improving emotional involvement, in entertainment for example, by improving video and audio comes closer to its limits [12]. For the future of emotions however, research has been concerned for some time about stimulating

F. Arafsha · K. M. Alam · A. El Saddik (✉)
Multimedia Communications Research Lab (MCRLab), School of Electrical Engineering and Computer Science, University of Ottawa, Ottawa, Ontario, Canada
e-mail: elsaddik@site.uottawa.ca

F. Arafsha
e-mail: faraf069@uottawa.ca

K. M. Alam
e-mail: mkazi078@uottawa.ca

🌠 Springer