

# A tactile actuation blanket to intensify movie experiences with personalised tactile effects

Esko O. Dijk, Alina Weffers-Albu and Tin de Zeeuw\*

Philips Research Eindhoven, High Tech Campus 34, 5656 AE Eindhoven, The Netherlands  
{esko.dijk,alina.albu}@philips.com

\* University of Twente, The Netherlands

**Abstract.** To enrich a movie viewing experience with personalised tactile effects, the Touch Blanket was created. It is a flexible blanket for use on a seat or sofa, with inside a 2D matrix of 176 small, individually controllable vibration motors attached to the fabric. One or two users sitting on the blanket can experience a range of tactile effects at their legs, arms and back, synchronised to events in a movie.

**Keywords:** Tactile stimulation, vibrotactile actuators, immersive experiences

## 1 Introduction

In television and movie entertainment, there is an ongoing trend towards a more engaging, realistic and *immersive* experience. In this context, systems have been built to involve the human senses of smell and touch [1] [2] in movie viewing. Our research focuses on the touch modality to intensify and enrich a movie viewing experience at home. In a domestic situation, it is not feasible to have state-of-the-art multi-sensory effects devices as found in theme parks. Key requirements for home use are: low cost, aesthetically unobtrusive, easy to install, easy to move and easy to use.

Commercial products in this area are *tactile transducers* [3], providing a tactile sensation in the viewer's seat, based on the low-frequency audio band of the movie being watched. However, these products are typically heavy, hard to install (e.g. bolted to a seat or floor), not easy to move, and offer little personalisation of the type of tactile effect and the intensity of the effect in case of multiple viewers.

To overcome these disadvantages, we created the Touch Blanket building on the work of Lemmens et al. [1]. It is a haptic actuation device to enrich a movie viewing experience at home with personalised tactile effects, including effects targeting specific body parts.

## 2 Touch Blanket system overview

The Touch Blanket exterior and interior are shown in Fig. 1. On the outside, it looks like a conventional blanket and it can be conveniently spread on top of a seat or sofa.

Inside, it contains 176 small, individually controllable small vibration motors (1cm diameter), arranged in a 2D matrix. Each motor can be set to 25 different intensity levels with an update period of less than 50 ms. Two persons can sit on it simultaneously, experiencing personalised effects at their legs, arms and back. The blanket form factor offers an easier way to experience the effects than the tactile jacket [1].



**Figure 1: (left) Touch Blanket spread over a sofa; (right) inside view, showing the wiring and part of the matrix of vibration motors attached to the fabric.**

To control the Touch Blanket, a C++ PC application was developed that generates tactile effects synchronised to a movie. This application uses effect scripts specifying what tactile effects are to be played, but it can also render effects based on video/audio features extracted from a movie.

What constitutes a good tactile experience is a matter of personal taste. Therefore, a suitable UI to allow personalisation is essential to have. In our current system, basic controls are available for users to easily adjust the intensity of effects and type of effects with minimal interruption of the movie experience.

For future work we consider (1) investigating in more depth what ways of user interaction are most pleasing and effective to let one or more persons control and personalise the Touch Blanket during movie viewing; (2) user tests to establish how much the blanket enhances the enjoyment of a movie and to what degree it increases the immersion of viewers. Our ultimate goal is a product that provides a truly personalised experience.

## References

1. Lemmens, P.M.C, Crompvoets, F., Brokken, D., Van den Eerenbeemd, J., De Vries, G.J.: A Body-conforming Tactile Jacket to Enrich Movie Viewing. In: WorldHaptics 2009, March 18-20, Salt Lake City, UT, USA (2009)
2. S. O'Modhrain, Oakley, I.: Touch TV: Adding Feeling to Broadcast Media. In: First European Conference on Interactive Television: from Viewers to Actors, Brighton, UK (2003)
3. Tactile transducer comparison, [http://www.baudline.com/erik/bass/tactile\\_report.html](http://www.baudline.com/erik/bass/tactile_report.html)