Twech: A Mobile Platform to Search and Share Visuo-tactile Experiences

Nobuhisa HANAMITSU[*1], Haruki NAKAMURA[*2], Mhd Yamen Saraiji[*1]
Kouta MINAMIZAWA[*1] and Susumu TACHI[*1]

[*1] Graduate School of Media Design, Keio University
[*2] Tokyo National College of Technology

Figure 1.1: *Record and Re-experience device*

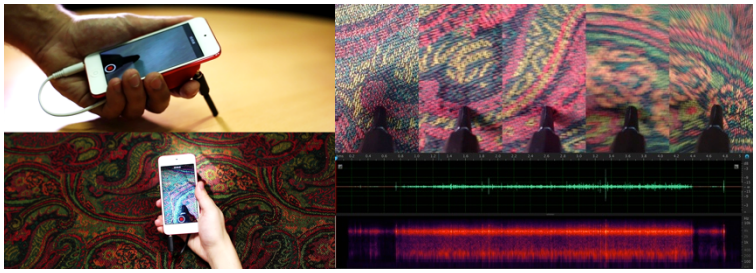

Figure 1.2: *Example of recorded experience' data (a scratching cloth)*

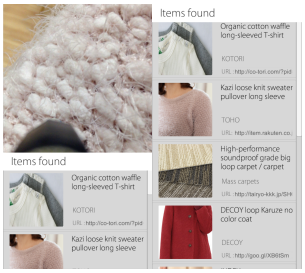

Figure 1.3: *Search results*

Overview

Twech is a mobile platform that enables users to share visuo-tactile experience and search other experiences for tactile data. User can record and share visuo-tactile experiences by using a visuo-tactile recording and displaying attachment for smartphone, allows the user to instantly such as tweet, and re-experience shared data such as visuo-motor coupling. Further, *Twech*'s search engine finds similar other experiences, which were scratched material surfaces, communicated with animals or other experiences, for uploaded tactile data by using search engine is based on deep learning that ware expanded for recognizing tactile materials. *Twech* provides a sharing and finding haptic experiences and users re-experience uploaded visual-tactile data from cloud server.

User Experience

Users can record haptic experience with in visual image. The recorded data is visual-and tactile experience by using visuo-motor coupling. Users feel just like own experiences by others shared experiences, for example to scratching material or to communicating with animals. When users use search engine, they can find similar tactile data from an inputted tactile data. Using this platform, people can capture and share their daily-life experience of touch to the Social network via smartphone so that our communication would be more emotional.

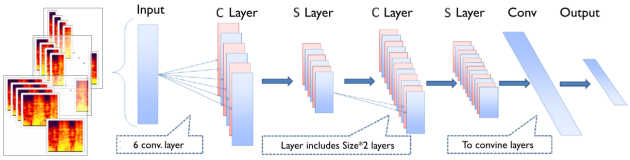

Figure 2: *Algorithm of tactile recognition*

*e-mail: contact@tachilab.org

SIGGRAPH 2015 Posters, August 09 – 13, 2015, Los Angeles, CA.
ACM 978-1-4503-3632-1/15/08.
http://dx.doi.org/10.1145/2787626.2792628

Record and Re-experience system

A record and re-experience device based on TECHTILE toolkit [Minamizawa et al. 2012], consists of a tactile amplifier, a tactile microphone that is able to capture frequencies as low as approximately 10Hz and a tactile actuator. The tactile microphone equipped bottom of a build-in smartphone camera. This equipment helps users to feel experience such as own experience. To re-experience recorded by users, this system uses visuo-motor coupling situation and accordingly playbacks the recorded tactile data. These give us the effect of embodied experience from shared experience

Haptic search engine based on Deep Learning

Haptic search finds similar tactile data by using convolutional neural networks [Krizhevsky et al. 2012] that expanded for tactile recognition. The input data was used spectrogram and divides between tactile property (0Hz-1000Hz) and audio property (1000Hz-20kHz). In addition to spatial property can suppose whether texture is roughness or not from two geometric dimensions of spectrogram. This engine uses those properties, decides weight values from them, learns deeply and makes the neural network for recognizing tactile data. The learned engine results similarities that calculated from an uploaded data.

Acknowledgements

This work is supported by JST-ACCEL Embodied Media project and JSPS KAKENHI Grant #26700018.

References

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