

TECHTILE toolkit

- A prototyping tool for designing haptic media -

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Figure 1: TECHTILE toolkit



Figure 2: Real-time haptic sharing



Figure 3: Recorded haptic video



Figure 4: TECHTILE workshops

“TECHTILE” is a fundamental concept by combining “TECHnology” with “tacTILE” perception/expression. Our aim is to disseminate the haptic technologies as the third media in the field of art, design, and education and extends the conventional “multi-media” which consists of visual information and auditory information.

There has been various haptic devices proposed so far, but most of them are still in emerging stage. To attract the interest of potential users of haptics such as designers, educators, and students, it is necessary to provide easy-to-make and easy-to-use haptic device. We then developed an introductory haptic device called “TECHTILE toolkit”.

In designing the toolkit, the most important point is that the toolkit can be used in favorite method for non-professional users. We then focused on the conventional method on auditory media. The sources of auditory sensation and tactile sensation are the same; vibration of an object generates a sequence of vibration of the air and perceived as sound, on the other hand, if the object were touched directly, it would be perceived as tactile sensation. When we create audio contents, we use microphone and speakers. The auditory sensation is recorded as a sequence of sound wave and we can easily edit using sound editors. If we want to share the audio contents on Internet, we can upload audio files (mp3, wmv, wav etc.) on YouTube or other content-sharing websites.

Current version of the toolkit (Figure 1) composed of a haptic recorder (microphone), haptic reactors (small voice-coil actuators), and a signal amplifier that is optimized to present not only the zone of audibility (30-20000Hz) but also low frequency (less than 30Hz) vibrotactile sensation. Although this toolkit is intuitive to use and can be developed with low cost, it can deliver even higher-realistic haptic sensation than many other conventional haptic devices.

Project website: <http://techtile.org/>

For example, if the user want to deliver the haptic sensation of “pouring liquid in a cup”, they just need to attach the haptic recorder on the bottom of a cup, and the haptic reactor on the bottom of another cup using scotch tape as shown in Figure 2. Then when they pour liquid in the cup with haptic recorder, the haptic sense from the liquid would be copied to another cup in real-time. It is also possible to record the haptic signal as an audio track of movie file through the USB port of the toolkit, and playback with video and sound as shown in Figure 3. It means that you can upload your original haptic contents on YouTube or Ustream to share the haptic content all over the world.

We are currently holding a series of workshops in universities and science museums as shown in figure 4, so that we have confirmed that this device is suitable as an educational tool for learning possible applications of haptic design. The attendees, aged from 6 to 50’s, could easily understand how-to-use the toolkit in just 10 minutes. After that, they can create their original haptic artworks using their personal belongings such as papers, crayons, scissors, umbrellas, sandals and so on.

In SIGGRAPH 2012 emerging technologies, we will demonstrate some examples of real-time haptic transmission, recorded haptic videos, and also we will hold rapid hands-on-workshops in our booth to show the essence of this toolkit.

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References

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