Touch and 3D Technologies for Human Display Interaction

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The opportunities to interactively communicate with a display screen have drastically been increasing in our daily life or various business scenes since the introduction of touch-input function into smartphones. We call such a communicative interaction between human being and display screens "Human Display Interaction", that is "HDI". There are two major technological fields related to HDI: touch and 3D technologies. Fig. 1 shows our roadmap on touch and 3D technologies for HDI. Touch and 3D technologies will be combined for more advanced HDI enabling innovative user experiences in the future.

The current touch technologies are employed mainly for menu selection, flick, drag and zoom-in/out of screen images. Since high-sensitivity technologies are very important for precise, smooth and stable touch input, we developed a noise reduction technology utilizing the correlated noise subtraction method[1]. Also, display users are still always seeking further useful functions and exciting experiences for more advanced HDI. A tactile display technology is one candidate of future promising touch technologies to give users novel sensations and experiences. We demonstrated an electrostatic tactile display using beat phenomenon of voltage waveforms enabling multi-finger different sensations[2].

On the other hand, autostereoscopic 3D display technologies are also gathering attention for more realistic HDI. Particularly, 3D touch technologies have recently been emerging in the field of Virtual Reality (VR) and Augmented Reality (AR) application. Although high-resolution and seamless 3D images have strongly been demanded for such applications, conventional 3D display technologies have not yet been able to satisfy users with regard to 3D image quality. To meet this users' demands, we proposed a new TR3i (Truly Realistic 3D imaging) system using an HxDP (Horizontally x-time Density Pixels) display. The new TR3i system optimizes a parallax value of arbitrary viewpoint images to reduce the influence of 3D-crosstalk space and to display motion parallax[3].

Fusion of such touch and 3D technologies as we developed is the key to future HDI providing innovative and attractive user experiences.
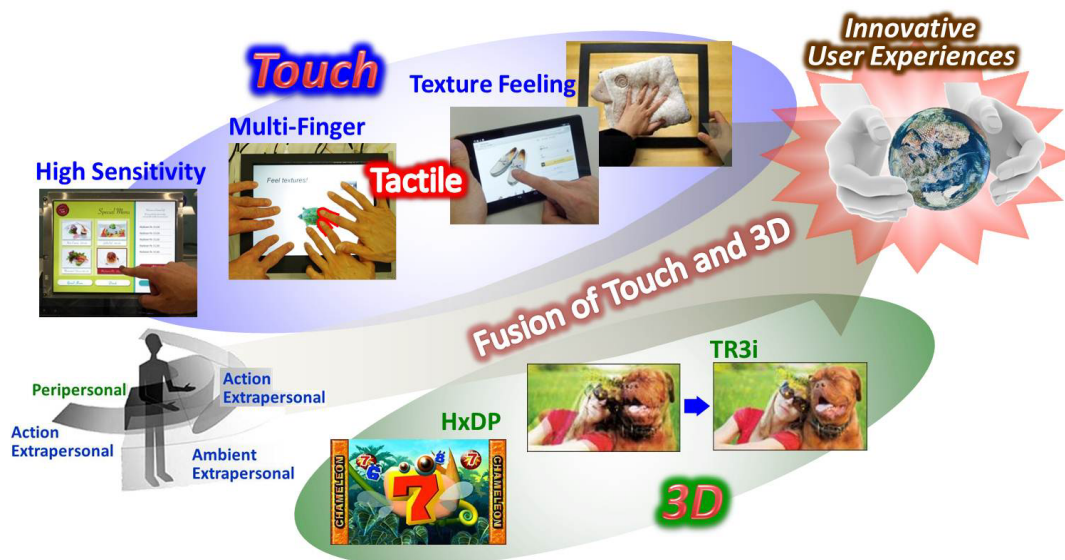

Fig. 1. Human Display Interaction Technologies.

References
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