

Texture integration in touch

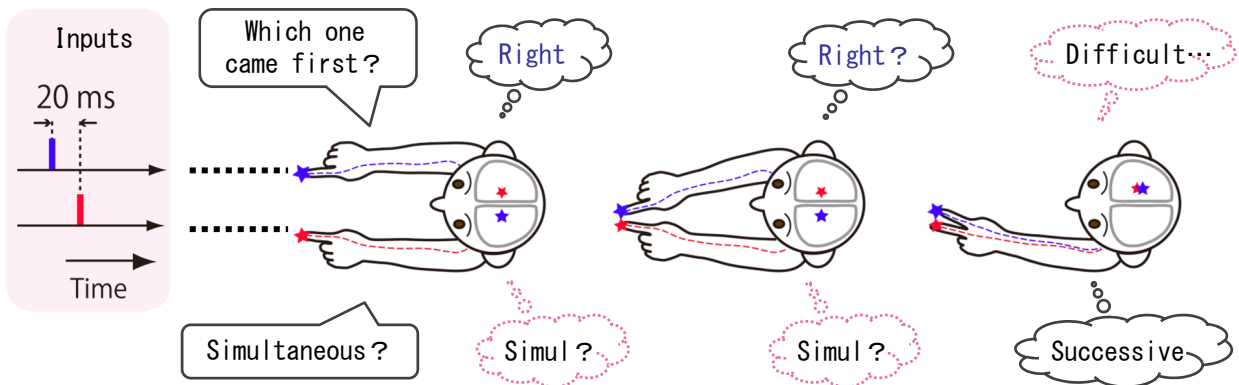
~Integration process of tactile perception~

Abstract

We demonstrate tactile illusions wherein features of two vibration stimuli presented to different body sites are perceptually mixed. When two stimuli are presented to the same hand with different onset timing of few dozens of milliseconds, the performance of temporal order judgment for the stimuli is worse than when two stimuli were presented to different hands (mix in timing information). When low- and high-frequency sinusoidal vibrations were simultaneously presented to different hands, they were perceptually mixed into an intermediate frequency (mix in frequency information). These illusions tell us how the tactile system integrates cutaneous information from different sites, and generates unified percept of the world.

Timing mixing

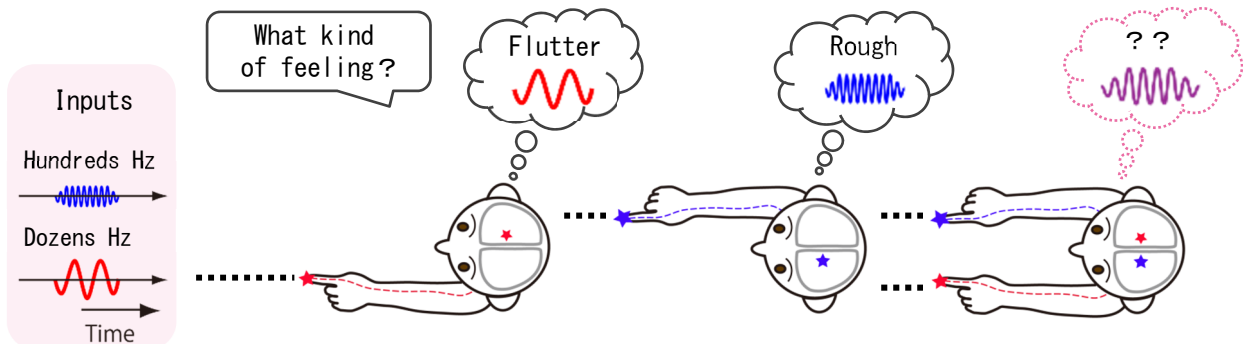
Perceived timings are confused depending on stimulated site



※ For temporal order judgment, two hands are better than one.
For simultaneity judgment, one hand is better than two.

Texture mixing

Stimulus attributes are perceptually mixed across different hands



※ low- and high-frequency vibrations are perceptually mixed into an intermediate frequency

Related work

[1] S. Kuroki, J. Watanabe, N. Kawakami, S. Tachi, S. Nishida, "Somatotopic dominance in tactile temporal processing," *Experimental Brain Research*, Vol. 203, pp. 51-62, 2010.

[2] S. Kuroki, J. Watanabe, S. Nishida, "Synthesis of tactile frequencies," in *Proc. 36th European Conference on Visual Perception*, 2013.

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