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Portfolio Paper

A Visualization Picture of Sound

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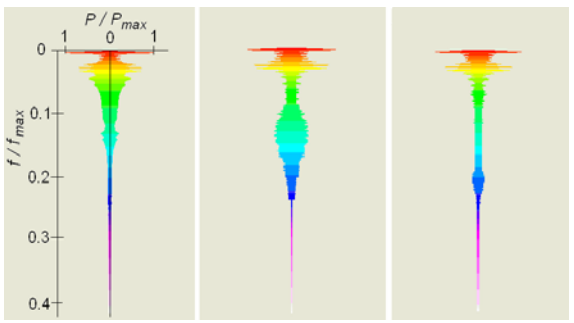
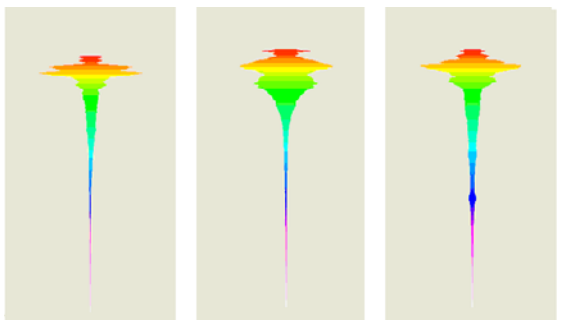


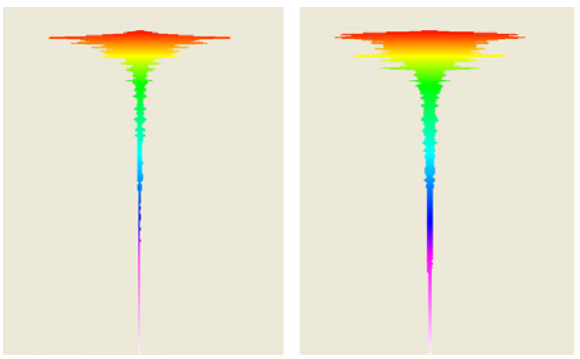
(a) Warbler (b) Frog (c) Cricket

Fig. 1. Chirp analysis.



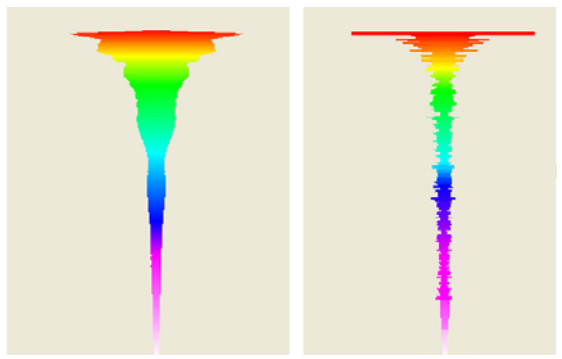
(a) Helicopter (b) Bullet train (c) Jackhammer

Fig. 2. Noise analysis.



(a) Yesterday (b) Yosaku

Fig. 3. Music analysis.



(a) Sound of sea wave (b) Image of sea wave

Fig. 4. Sea wave analysis.

Until now the analysis of sound examined has focused on natural and manmade sounds(1). This research attempted to express sound like a picture that would remain in the viewer's heart. Figures 1, 2 and 3 show pictures of the results of frequency analysis of chirps, noise and music. The ordinate shows f/f_{max} (f: frequency, f_{max} : maximum value of frequency), and the abscissa shows P/P_{max} (P : power spectrum, P_{max}: maximum value of power spectrum), as shown in Fig. 1(a). The picture is symmetrical to the axis of the ordinate and color varies with the frequency. The difference in sound can be clarified from the picture. As a result, sound was able to be expressed in a visual art picture which can be understood by anyone. The red region of a picture is relatively large for sounds with a healing effect, as shown Fig. 1 and Fig. 3. The yellow region is large for an unpleasant sound, as shown Fig. 2. Furthermore, the sound and image frequency analysis of the sea wave were able to be expressed like a picture as shown Fig. 4. It is clear that the sound and image of the sea wave have a healing effect, like music or a bird song, since the red color region of these pictures of the sea wave becomes comparatively large.

References : (1) Ohmi, K., J. of Visualization, 10-3 (2007), 257-258.