

REAL-TIME VISUALIZER/EQUALIZER OF HARMONIC AND PERCUSSIVE COMPONENTS IN MUSIC SOUNDS

Emiru Tsunoo, Kenichi Miyamoto, Nobutaka Ono, Shigeki Sagayama
*Graduate School of Information Science and Technology
The University of Tokyo*

Our system presents a visualization of the energy proportion of harmonic and percussive components of music audio signals, and enables to control the balance between them in real time. Our method can be used not only as an extended audio equalizer, but also as a preprocessing step for various tasks related to music information retrieval (MIR) as audio genre classification, multiple fundamental frequency estimation, rhythm analysis, etc.

To estimate each component without any prior knowledge about constituent instruments, we exploit the anisotropic nature of the observed spectrogram, i.e., the fact that the harmonic components are distributed horizontally (time-wise), while percussive component are distributed vertically (frequency-wise). Our method separates the input audio signal into these components by utilizing a MAP estimation framework with iterative update equations.

We have implemented a real-time visualizer/equalizer system that runs under the Windows environment. For the sake of online processing, we use the sliding analysis window technique. Harmonic and percussive sounds separated by our method are remixed with arbitrary balance, and their estimated proportion can be visualized for each spectrotemporal bin.