

VOICE PRINTS AS A TOOL FOR AUTOMATIC CLASSIFICATION OF VOCAL PERFORMANCE

Claus Weihs

Uwe Ligges

University of Dortmund, Germany

Background

In order to find objective criteria for the assessment of the quality of vocal performance, time series of voice generated vibrations (so called waves) were measured in a standardized experiment (Weihs et al., 2001).

Aims

We are interested in properties of such time series related to performance quality aspects of single tones like purity of intonation, vowel purity, vibrato intensity, solidity of tone, and softness / brilliance of tone.

Main Contribution

Based on a segmentation of the waves into notes (Ligges, 2000 and Ligges et al., 2002), the individual tones are judged from the estimated periodogram of the sung notes. Intonation accuracy is estimated by the half-tone distance from the ideal

tone. In order to analyze the the aforementioned quality aspects, we consider the widths and the heights (amplitudes) of the periodogram peaks corresponding to the fundamental frequency and the first twelve overtones. From this, formant intensity and amplitude variation of the different overtones are derived.

Implications

From these measures we derived so-called **voice prints** characterizing the voices and clustered the voices into groups of similar voice type. This way, it was possible for example to separate the professionals from the amateurs (Güttner, 2001).

Voice prints for vocalists are compared to corresponding **instrument prints** of selected instruments. Construction and comparison of voice and instrument prints are demonstrated.