

Improved Pitch Detection Using Fourier Approximation Method

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Abstract : Automatic Music Information Retrieval has been one of the challenging topics of research for a few decades now with several interesting approaches reported in the literature. In this paper we have developed a pitch extraction method based on a finite Fourier series approximation to the given window of samples. We then estimate pitch as the fundamental period of the finite Fourier series approximation to the given window of samples. This method uses analysis of the strength of harmonics present in the signal to reduce octave as well as harmonic errors. The performance of our method is compared with three best known methods for pitch extraction, namely, Yin, Windowed Special Normalization of the Auto-Correlation Function and Harmonic Product Spectrum methods of pitch extraction. Our study with artificially created signals as well as music files show that Fourier Approximation method gives much better estimate of pitch with less octave and harmonic errors.

Keywords : pitch, fourier series, yin, normalization of the auto- correlation function, harmonic product, mean square error

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