

Research Title: Design and Implementation of A New Digital Filter for Low- Complexity High-Accuracy Digital Hearing Aids

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ABSTRACT

This research proposes design of variable filter bank (VFB) based on classical s-z transformation method and nonlinear optimization. The variable filter bank (VFB) consists of variable lowpass, variable bandpass, and variable highpass digital filter constructed by parallelizing, which are transformed from analog prototype Biquadratic and modified bilinear transformation. The magnitudes (gains) and band edge frequencies of variable digital filters are independently adjustable which the frequency characteristic for each digital filter can be obtained from Nelder-Mead optimization in order to give the combination of amplitude response of digital filter is suitable for digital hearing aids application, which can compensate the hearing loss pattern.

Keywords : Variable digital filter, Biquadratic, Bilinear transformation, Nelder-Mead Optimization