

DESIGN OF ALLPASS-BASED NON-UNIFORM OVERSAMPLED DFT FILTER BANKS

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ABSTRACT

In this paper we describe a novel approach for the design of near-perfect-reconstruction mixed FIR- / allpass-based quadrature mirror filter banks. The design is carried out in the polyphase domain, where FIR filters, obtained via simple closed-form expressions, are employed for compensating the non-linear phase introduced by the allpass filters. Starting from a generalized two-band structure, we introduce three different types of analysis-synthesis banks based on the same design principle. In all systems the remaining amplitude and phase distortions can be made arbitrarily small at the expense of additional system delay. Simultaneously, aliasing can be minimized, or completely canceled if further delay can be tolerated.