Tunable and variable passive digital filters for multimedia signal processing

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Abstract
This paper introduces a class of tunable and variable digital filters, which are derived from the passive digital filters. By changing the values of their filter coefficients, the frequency response characteristics of these passive digital filters can be tuned or varied. These tunable and variable passive digital filters include first-order and second-order lowpass and highpass digital filters, and second-order bandpass and bandstop digital filters. 2-D and 3-D tunable and variable passive digital filters can be obtained by cascading 1-D filter sections. Simulation results are given to illustrate their frequency response tunability and variability. Due to their pseudopassivity property, these variable passive digital filters are oscillation free under finite word-length operations.

References

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