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Time-domain design and lattice structure of FIR paraunitary filter banks with linear phase.

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Summary: The authors present a novel way to design biorthogonal and paraunitary linear phase filter banks. The square error of the time-domain constraints on the perfect reconstruction filter bank is expressed in a quadratic form with respect to the filter coefficients. This cost function is minimized by solving a set of linear equations iteratively. This means one can design biorthogonal filter banks without using nonlinear programming techniques. With some modifications, the method can be extended to the design of paraunitary filter banks. In addition, the lattice structure of paraunitary filter banks with filter length $KM+\beta$ is also derived. Finally, some design examples are presented to validate the proposed method.

MSC:

[94A12](#) Signal theory (characterization, reconstruction, filtering, etc.)

Keywords:

[filter banks](#); [linear phase](#); [lattice structure](#); [time-domain design](#)

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