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A New Method For the Design of Quadrature Mirror Filter Bank

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Abstract - Literature review revealed, a constrained optimization technique used for the design of a two channel quadrature mirror filter (QMF) bank. In this paper a new method is developed based on ideal characteristics of the prototype filter and overall response of filter bank in transition band. The design problem is formulated as nonlinear constrained optimization of an objective function, which is weighted sum of square of error in pass band, stop band and ($w = 0.5$) in transition band. For solving the given optimization problem, sequential quadratic programming (SQP) optimization technique is used. Performance of this method are evaluated in terms of reconstruction error, mean square error in pass band, stop band and transition band. The simulation results included in this paper illustrate the superiority of the proposed method over the other existing techniques.