论文

基于遗传算法的递归式MTI滤波器的设计

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摘要
递归式MTI滤波器从理论上讲几乎可以合成任意形状的频率响应函数,因而具有很广的应用范围。为了能够灵活设计出满足系统要求的递归式MTI滤波器,提出了一种设计方法。该方法以遗传算法(GA)的基本思想为基础,利用滤波器的改善因子、通带宽度和通带波纹来构成适应函数,并用GA来加快参量搜索速度和获取全局近似最优解。实验仿真设计了两种典型的递归式MTI滤波器,结果证明该方法是一种有效的设计方法,它可以灵活而快速地设计出所需要的滤波器。

关键词　　递归式MTI滤波器　遗传算法　改善因子　通带宽度　通带波纹

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DESIGN OF RECURSIVE MTI FILTER BASED ON THE GENETIC ALGORITHM

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Abstract
In theory, it is possible to synthesize any frequency response curve with the recursive MTI(Moving Target Indication) filters. As a result, the applied field of this kind of filter is wide. A new design method is presented to design flexibly a recursive MTI filter that can meet the specifications of the system. The method is based on the Genetic Algorithm (GA) and constitutes the fitness function with improvement factor, passband width and ripple of a filter. It speeds the search process and achieves near-global optimum parameters by means of the GA. Two kinds of classical recursive MTI filters are designed in this paper. The results demonstrate the validity of this design method that can design flexibly and quickly a required filter.

Key words　Recursive MTI filter　Genetic algorithm　Improvement factor　Passband width　Passband ripple

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