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Literature Review of Iir Digital Notch Filter

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ABSTRACT- This document is a test of the various methods or techniques of IIR digital notch filter design. The notch filter significantly reduces or eliminates a certain frequency element from the input signal spectrum while leaving the frequency intensity unchanged. So, basically a band stop filter with a very small band and two pass bands. When constructing an active filter circuit, high tolerance materials must be used to obtain optimal performance. Frequency should be 1% or better. A notch depth of 45 dB can be obtained using 1% elements, or in theory it is possible for a notch to be in the order of 60 dB using appropriate materials. In general, notch filter design with good pole placement, minimax optimization, phase specific features, and lattice wave notch filter with short duration, as well as designs based on genetic algorithms, 2D frequency representation etc. . The design strategy aims to create an efficient filter. This paper aims to review the various ways to create an IIR digital notch filter in books.

KEYWORDS: Notch filter, lattice wave notch filter filter, minimax optimization, state space representation, algorithm2D volume change, pole positioning.

I. INTRODUCTION

Digital Signal Processing (DSP) is the process of using multiple mathematical algorithms and computers to analyze and convert signal from real signal to highly efficient signals. There are two types of notch filters that are end-response (IIR) and response-response (FIR) filters. Digital notch filters can be built as IIR and FIR frameworks. Compared to the latest, IIR filters have advantages that require low orders of close proximity to a given set of data. Notch filters remove one unwanted frequency item from the signal such as an example of a network company that can be controlled by means of communication or power line interference from a sample signal. Notch filters have been used in various situations over the years and are still being developed. The purpose of this paper is to conduct a comparative study of the construction of digital IIR notch filters.

Some papers are arranged like this. The literature review is described in section II. Applications for digital IOT notch filters are introduced in phase III. The closing words are given in paragraph IV.

II. LITERATURE REVIEW

A. ENSURANCE OF YOUR POSITION NOTICE OF ORDINARY POLICE APPLICATION

Here Chien-Cheng Tesng described two design steps for the IIR notch filter, one of which is the number of filter transfer functions obtained by placing the eggs in a unit circle at angles equal to the fixed note size. Second the polynomial denominator is determined using a retrieval system where the pole is positioned correctly.

Proper positioning of the pole, is a method of constructing a straight quadratic controller with closed shafts. The design method uses a series of rotations or a single real pole or complex beams to connect at a time. The pole radius in the construction of a single notch filter is specified by the designer of the design notch filter design, the pole radius is an obstacle through the use of Rouche's Theorem, as a result of which this method has fewer options than conventional methods.

B. Design of IIR digital notch filter

Zhang Weixi has proposed a new construction. He also described two requirements for designing a filter, one that the transfer function notes must be in combination. As a result the frequency elements will not be affected without the frequency of the notch. Filters that do not meet these requirements are considered notch filers. In order to obtain a flexible band many poles must be discarded, so that the influence of the large response caused by the zero drop in the band's pass band can be removed.

Due to the stability of the filter, poles should be inserted within the unit circle. Apparently the sticks are close to the unit circle, clarifying the function of removing the poles from the eggs and when the filter stop band becomes smaller, the transition band is much faster.

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C.DESIGN OF A REGENERATIVE DIGITAL NOTCH FILTER WITH LINEAR FEATURES

In this paper, Goran Stancic designer Sasa Nikolic proposes an alternative to the design of digital line filters using a coherent link line delay and IIR all pass filter filters with almost a linear phase. The error element of the section applied to the entire pass filter equals the amplitude of the detected filter element depends on the delay line and all the differences in the filter category.

This method works very well requires a small amount of duplication and can be used for the construction of compatible filters. The problem arises when two waves are too close. In that case the minimum and maximum size disappeared in the error curve of the section making it insufficient to measure all the equality function of the filter transfer.

With one additional filter filter the output of the signal segment in two waves can be obtained.

D. MULTI-DIGITAL FILTERING DESIGN BASED ON GENETIC ALGORITHM.

First, Qiushng Wang, Jialing Song, Haiwen Yuan described these two types of notch filters in the infinite response of the first single single-word filter removing only the parts of the single band. It can be designed directly with a logical second-mode multi-notch filter application, cascading method is an easy way to design multiple notch filter.

Available by dragging a second detailed layout good for a single filter. But it often leads to an uncontrolled magnitude of distortion and should be avoided in the construction of a notch filter.

Genetic algorithm is a method of solving both reduced use problems according to a natural phase process that mimics the natural evolution of GA is often used to produce a high-quality solution for optimization and search problems.

Compared to the classical cascading method and this submitted method can get better results, especially under the condition of small notch limits. This method can be widely used in electronic measurement, communication techniques, energy system, biological engineering and other fields.

E. 2D ZERO 2D IIR AIRCRAFT FILTER DESIGN BASED ON STATE SPACE REPRESENTATION OF 2D FREQUENCY CONVERSION

Proposed paper Shi Yan, Lijun, Li Xu tells us two ways of establishing the state space, of the filter obtained by the frequency change. Another is to get the state space model from the modified filter transfer function. Another discovery through the representation of state space or the formation of a 2D frequency transition could be the Roesser method or the Forsasy Marchesini 2nd (FM 2) model.

The purpose of this paper is to introduce the process of building notch filters for 2D zero phase IIR. It will be shown that the 2IR zero filter phase IIR notch can be detected by constructing the state of the 2D frequency converter according to the FM 2 model. That distortion caused by the non-linear phase can be avoided. The proposed metbod filters easily and is designed to work better than the corresponding frequency domain.

F. AN EFFICIENT NOTCH FILTER DESIGN USES MINIMAX OPTIMIZATION TO REDUCE NOISE OF 50HZ ON ECG

Designer Vineet kumar, SreejithS Nair, Puneet Mishra has proposed a new approach, singing minimax optimization. With the design of the IIR idal filter the value of the pole radius remains constant. However, the stability of the otch filter should be less than unity.

The pole radius value plays an important role in controlling the width of the notch filter band. Proper placement of ad zero poles can get the desired notch filter features This method is called the pole placement method. The desgn using the pole zero placement method has asymmetric pass band gaindue in the wrong selection of pole angles.

To solve this problem, you need the right piece of poles when the version is modified. By designing a notch filter using the optimization process, a good IIR notch filter is required to calculate the amount of obje function that you want to reduce the usng minimax optimization technique. Minimax's process of optimizing is to reduce the cost of the performance objective, it should have a fiter knowledge. The second IIR order filter filter function has therefore been used as part of the objective function. In contrast to the response size of a good notch filter and the proposed IIR nth filter design. The proposed Tis function works very well.

G. INTEGRATED APPROACH TO THE CONSTRUCTION OF IIR AND FIR NOTCH FILTERS.

Yi jiang. Jianxin dai, used a straightforward method to obtain multiple notch filter to insert several single notch filters, each corresponding to a single notch frequency, this method has some problems such as high band height and high sensitivity to unequal distortion. The second method combines the notch H (z) filter using all pass pass A (z) and their relationships

H (z) = 1/2 (+ A (z))

This also does not work well. Next up using convex optimization, not only theoretically, designing notch filters using utility tools, but also the possibility of using those designs.

But it is complicated by computer and often suffers from slow interactions. Here the integrated design approach for both IIR and FIR filters is an internal poi t method, a specific phase of the algorithm. That solves the problems of line enlargement and indirect linearity.

H. DESIGN AND FPGA IMPLEMENTATION OF LATTICE WAVE DIGITAL NOTCH FILTER FOR A SHORT PERIOD OF TIME

The proposed paper, Abhay Sharma tells us that a digital notch filter can be made using a dynamic response (FIRE) or an unlimited response form (IIR). Inorder to reduce computer complexity and signal process delays, IIR notch filter is preferred over FIR

Temporary response time depends on the filter order, which is why the low-order notch filter selects the designer. A small IIR notch filter for a long time is a temporary response. The proposed solution is to inorder the previous pressure by changing the notch band width and time. The proposed activity provides a solution to reduce the number of memory units. Introducing the digital IOT notch filter design using a lattice wave digital filter. It is shown that in order to differentiate the notch width and time, only one adapter coeffient has variable values. So one unit of memory is heard.

APPLICATION

In different technologies, IIR digital notch filters are used for a variety of purposes.

• In call technology, note filters are used as voice enhancers and DSL internet services. It will also help remove line interference that reduces DSL performance.
• Band stop filters or notch filters are widely used in amplifiers on electric guitar. In fact, this electric guitar produces 'hum' at 60Hz frequency. This filter is used to reduce the ‘hum’ to amplify the signal produced by the amplifier and make advanced equipment, these are also used in other acoustic applications such as mandolin, base instrument amplifiers.
• Inverted signals are distorted due to a specific sound that causes the original signal to interfere with other signals that lead to errors in the output. These types of filters are therefore used to eliminate unwanted noise.
• Notch filters are used to reduce radio statistics, which are widely used in our daily lives.
• Can also be used in light communication technology, at the end of fiber optical fiber there may be occasional interruptions to light beam. Distortion is removed with notch filters. An excellent example in Raman spectroscopy.
• In image processing and signal processing these filters are popular for rejecting sound by using notch filters.
• Notch filters are used for high quality audio applications in the public address system.
• Digital notch filters are also used in biomedical tools such as EGC to remove line noise.

III. CONCLUSION

Typically IIR digital notch filters design with various features such as well-positioned pole design, short-term parallel features, internal point method based on genetic algorithm and spatial representation etc. The digital lattice wave digital notch filter is short-lived, where the transfer function of the second order notch filter is based on the wavelength coefficient. These coefficient values are determined by the notch frequency and filter band width.it and the indication of the inorder of the filter band width and time, the IIR recognition requires two equal variables, and the proposed LWDNF operates only one variable variable. . This reduces the memory size required for half-initialization. LWDNF only requires less than 50% memory compared to a normal and stable IIR filter.

REFERENCES

[1]. Tseng C. c , Pei S. iC,“Stable IIR inotch ifilter design with ioptimal ipole iplacement”,IEEE Trans. Signal process, 2001,49,(11),pp.2673-2681ttps.
[2]. Qiusheng Wang; Jialing isong;Haiwen yuan, “Digtal multiple notch filter design based ion GeneticAlgorithms,”https://ieeexplore.ieee.org/document/6995015/
[3]. Goran iStancic ;sasa inikolic “Design of digital irecursive notch filter withlinear phase characteristics,”http://ieeexplore.ieee.org/document/6951523/
[4]. ZhangWeixi;Zhang Li “ the Design of digital notch filter”
[5]. Yi jiang, cong ishen, jiaxin dai “A iunified iapproach to the design of IIR and FIR notch filters,”
[6]. Hemang K Jayant , K P S Rana , Vineet kumar, Sreejith inair, puneet mishra“ efficient IIR inotch filter desin using minimax ioptimization for 50Hznoise suppression in ECG,” https://ieeexplore.ieee.org/document/73755043
[7]. Abhay iSharma, itarun ikumar irawat, iAnjali iagrawal, “Design iand iFPGA iimplementation iof ilattice iwave idigital inotch ifilter iwith iminimal itransient iduration,”

iyear:2020/volume:14,issue:7/ ijournal iArticle/ ipublisher:IETihttps://ieeexplore.ieee.org/document i/9181748/

[8]. Shi iyan, ilijun isun, ilixu, i“2D izero iphase iiir inotch ifilter idesign ibased ion istate ispace irepresentation iof i2D ifrequency itransformation,”https://ieeexplore.ieee.org/document i/7169160