Digital Signal Processing Assignment 3

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1 Introduction

Introduce real world problem which requires filtering
photos of the setup
dataflow diagrams
YouTube clip(s)
Present results??

2 Sampling Rate Verification

running it for example for 10secs and check against the number of samples expected
check for jitter?
timer class

Figure 1: The Universe

3 Frequency Response

Determine the filter response(s) which are required and justify them
Generate the SOS coefficients for the filter

4 Filter Class

4.1 2nd Order Filter

IIR2Filter which implements a 2nd order IIR filter
takes the coefficients in the constructor
input output are scalars
no arrays for buffer and coeffs

The 'IIR2filter' Class takes the SOS coefficients in as its constructor. Thes coefficients are stored as a0, a1, a2, b0, b1, b2 and two buffers are initialised; buffer1 and buffer2. within this class a filter function is implemented. This 2nd order IIR filter uses two accumulators; acc_ input, and acc_ output

4.2 Chain of 2nd Order Filters

takes the SOS array from the high level IIR design commands as its constructor argument
which then creates a chain of 2nd order filter instances of IIR2Filter classes
Thus they form an array of instances of IIR2Filter
input output scalars
internally processes the data by sending it through the chain of 2nd order IIR2Filter classes
Implement the filtering operation again in the most effective way by not using index operations.

5 Results

Compare your filtered results with the original recordings
have you been successful
Do a critical analysis