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1 //To make a digital IIR Filter
2 clc;
3 clear;
4 ieee(0);
5 pi=%pi;
6 f1 =1000; // input('Enter the pass band edge (Hz )= ');
7 f2 =3000; // input('Enter the stop band edge (Hz )= ');
8 k1 = -1; // input('Enter the pass band attenuation (dB)= ');
9 k2 = -15; // input('Enter the stop band attenuation (dB)= ');
10 fs =10000; // input('Enter the sampling rate (Hz )= ');
11 // Digital filter specifications(rad)
12 w1 = 2*pi*f1*1/fs;
13 w2 = 2*pi*f2*1/fs;
14 // Pre warping
15 o1 = 2*fs*tan(w1 /2);
16 o2 = 2*fs*tan(w2 /2);
17 // Design of analog filter
18 n = log10(((10.^((-k1)/10))-1)/((10.^((-k2)/10))-1))./(2*log10(o1/o2));
19 n = round(n);
20 wn = o2./((10.^(- k2 /10) -1).^ (1/(2* n)));
21 h = buttmag(n,wn,1:2*pi*fs);
22 mag = 20*log10(h);
23 // Converting analog to digital filter
24 hz = iir(n,'lp','butt',0.25,[]);
25 [hzm,fr ] = frmag(hz,256);
26 magz = 20*log10(hzm);
27 subplot(2,1,1);
28 plot2d((1:2*pi*fs),mag);
29 title('Analog IIR Lowpass Filter','fontsize',3);
30 xlabel('Analog Frequency in rads/s','fontsize',2);
31 ylabel('dB','fontsize',2);
32 xgrid(1);
33 subplot(2,1,2);
34 plot2d(fr,magz);
35 title('Digital IIR Lowpass Filter','fontsize',3);
36 xlabel('Digital Frequency','fontsize',2);
37 ylabel('dB','fontsize',2);
38 xgrid(1);
39

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