

Filter Design Results

Generated by: <http://www-users.cs.york.ac.uk/~fisher/mkfilter>

Summary

You specified the following parameters:

filtertype = Butterworth
passtype = Bandpass
ripple =
order = 1
samplerate = 8000
corner1 = 3000
corner2 = 3750
adzero =
logmin =

Results

Command line: /www/usr/fisher/helpers/mkfilter -Bu -Bp -o 1 -a 3.7500000000e-01 4.6875000000e-01
raw alpha1 = 0.3750000000
raw alpha2 = 0.4687500000
warped alpha1 = 0.7684680443
warped alpha2 = 3.2318545105
gain at dc : mag = 0.000000000e+00
gain at centre: mag = 4.140088960e+00 phase = 0.0861680274 pi
gain at hf : mag = 0.000000000e+00

S-plane zeros:
0.0000000000 + j 0.0000000000

S-plane poles:
-7.7389568252 + j 6.1770732439
-7.7389568252 + j -6.1770732439

Z-plane zeros:
1.0000000000 + j 0.0000000000
-1.0000000000 + j 0.0000000000

Z-plane poles:
-0.7071067812 + j 0.1857717308
-0.7071067812 + j -0.1857717308

Recurrence relation:
$$y[n] = (-1 * x[n-2])$$
$$+ (0 * x[n-1])$$
$$+ (1 * x[n-0])$$

$$+ (-0.5345111360 * y[n-2])$$
$$+ (-1.4142135624 * y[n-1])$$

Ansi ``C" Code

```
/* Digital filter designed by mkfilter/mkshape/gencode   A.J. Fisher
   Command line: /www/usr/fisher/helpers/mkfilter -Bu -Bp -o 1 -a 3.7500000000e-01 4.6875000000e-01 -l */

#define NZEROS 2
#define NPOLES 2
#define GAIN    4.140088960e+00

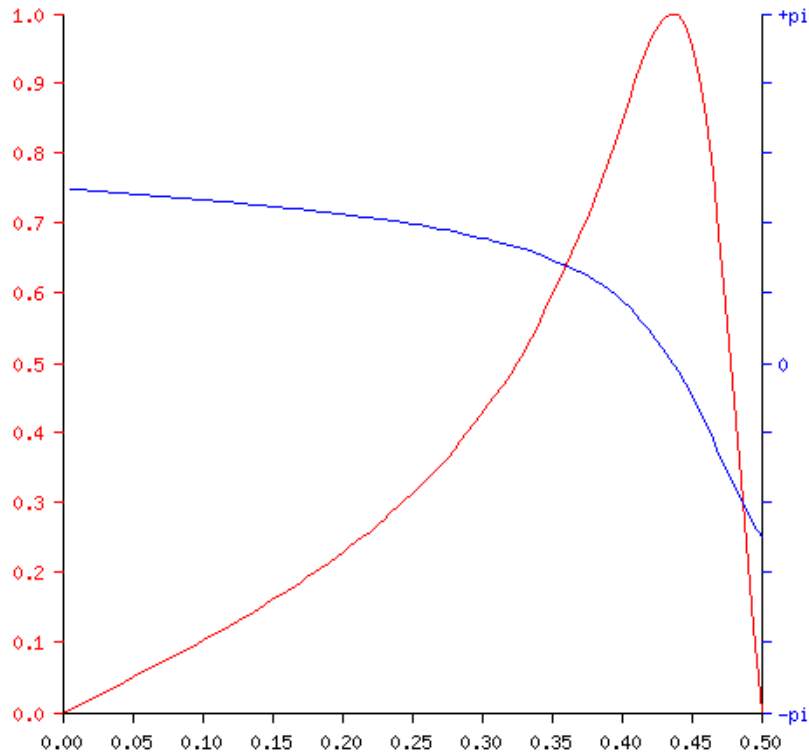
static float xv[NZEROS+1], yv[NPOLES+1];

static void filterloop()
{ for (;;)
  { xv[0] = xv[1]; xv[1] = xv[2];
    xv[2] = next input value / GAIN;
    yv[0] = yv[1]; yv[1] = yv[2];
    yv[2] = (xv[2] - xv[0])
            + ( -0.5345111359 * yv[0]) + ( -1.4142135624 * yv[1]);
    next output value = yv[2];
  }
}
```

Download code and/or coefficients:

Magnitude (red) and phase (blue) vs. frequency

- x axis: frequency, as a fraction of the sampling rate (i.e. 0.5 represents the Nyquist frequency, which is 4000 Hz)
- y axis (red): magnitude (linear, normalized)
- y axis (blue): phase

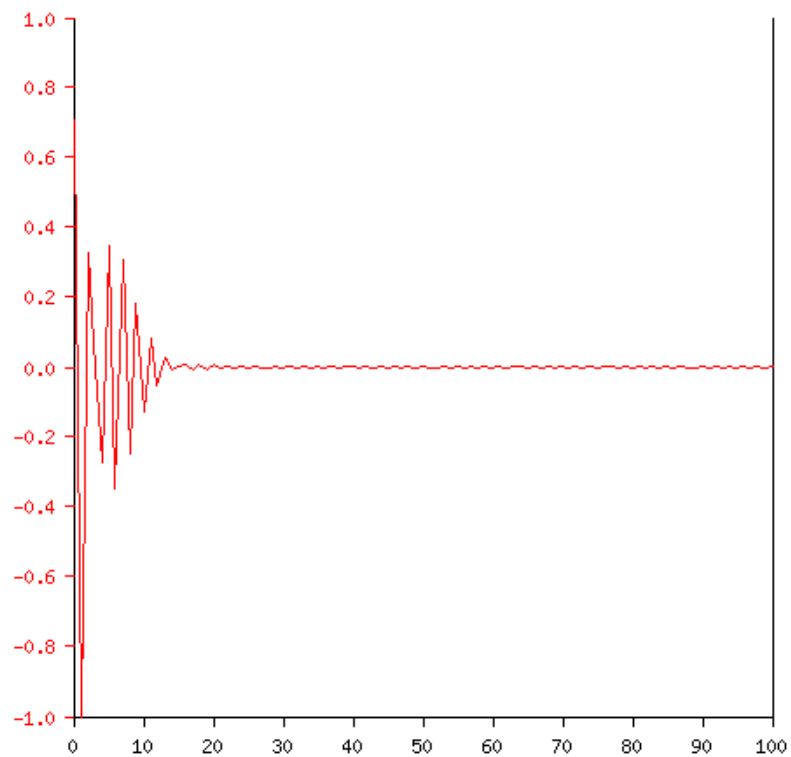


For an expanded view, enter frequency limits (as a fraction of the sampling rate) here:

Lower limit: Upper limit:

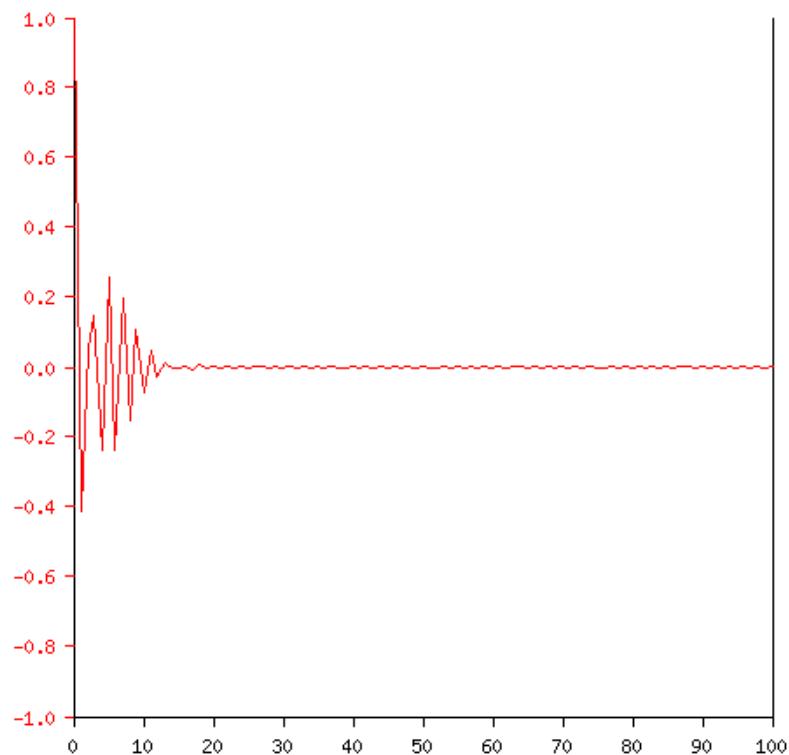
Impulse response

- x axis: time, in samples (i.e. 8000 represents 1 second)
- y axis (red): filter response (linear, normalized)



Step response

- x axis: time, in samples (i.e. 8000 represents 1 second)
- y axis (red): filter response (linear, normalized)



For a view on a different scale, enter upper time limit (integer number of samples) here:

Upper limit:

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