$$x_2[n] \rightarrow y_2[n]$$
$$c_1 x_1[n] + c_2 x_2[n] \rightarrow c_1 y_1[n] + c_2 y_2[n]$$

The process introduces an error because of the limited number

For $k = \Delta t$ this leads to $F_s(\omega) = F(\omega)$, only the term for $m=0$ remains and

0.5

On contrary to the IIR filter, Finite Impulse Response (FIR) filters are always stable[5] because of the lack of any feedback. The general expression for FIR filters is

$$y[n] =$$

features an additional term $(i\omega)^n$

which is also a good approximation only at low frequencies[10], while high frequencies are also attenuated compared to the true transfer function $H(\omega) = -\omega^2$

$c_{11}[$

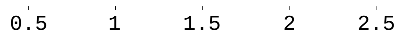
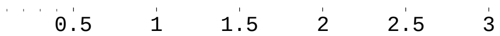

0.5
1
1.5
2
2.5

Figure 1.12: **Original and decimated detector signal.**

1.8. DIGITAL RESAMPLING: DECIMATION AND INTERPOLATION

with $n < x < n + 1$. The transfer function can be derived by applying the symmetrical form of the linear interpolation

$$y(x) = y \; n$$


0.5
1
1.5
2
2.5
3

1. IIR (Recursive) Filter:

y

- **Binomial Distribution with P = 1/2: 5 Points**

$$y[n] = \frac{1}{16}x[n-2] + \frac{1}{4}x[n-1] + \frac{3}{8}x[n] + \frac{1}{4}x[n+1] + \frac{1}{16}x[n+2]$$

(c) Low Pass FIR Filter

$$c[n] = (2f_c)^{\sin(2 \qquad + \quad 1}$$

(c) **5 Points**

$$y[n] = \frac{1}{12}x[n+2]) + \frac{8}{12}x[n+1] - \frac{8}{12}x[n-1] - \frac{1}{12}x[n-2]$$

(d) **7 Points**

1

$$y[n] = \frac{1}{60}x[n+3]+$$