

2024 Nov 18

$$y[n] = x[n] - 2\cos(\omega_c)x[n-1] + x[n-2] \\ + 2a\cos(\omega_c)y[n-1] - a^2y[n-2]$$

$$\omega_c = 0.85 \text{ radians/sample}$$

$$B = 0.001 \frac{\text{radians}}{\text{sample}} = -2\ln(a)$$

$$-0.0005 = \ln(a)$$

$$a = e^{-0.0005}$$

$$y[n] = x[n] - 2\cos(0.85)x[n-1] + x[n-2] \\ + 2e^{-0.0005}\cos(0.85)y[n-1] - e^{-0.001}y[n-2]$$