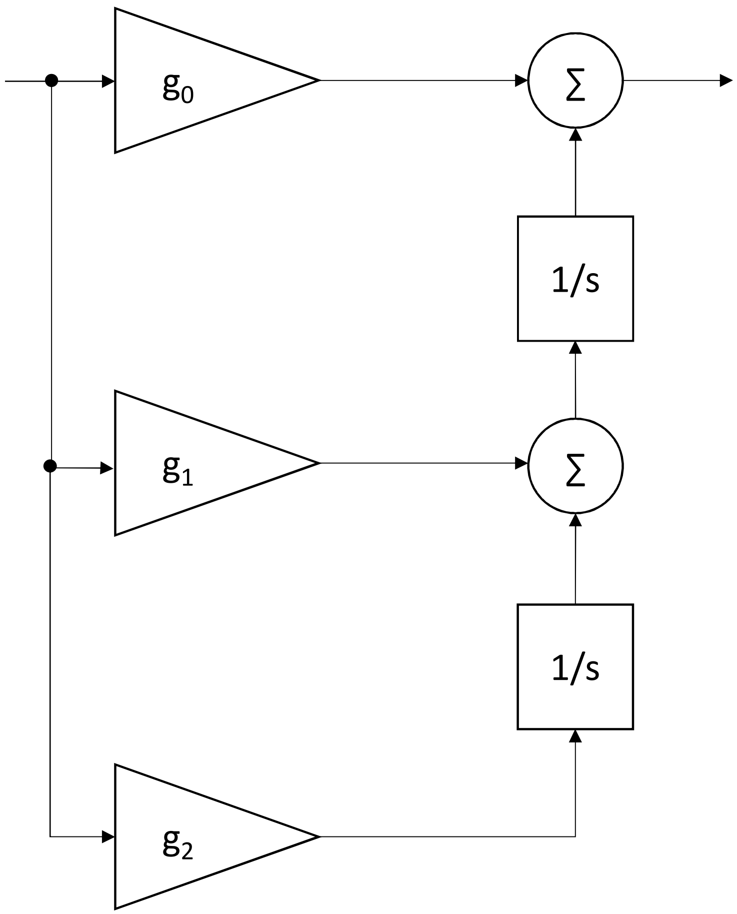

$$H(z) = g_0 + \frac{T}{2}*(\frac{1+z^{-1}}{1-z^{-1}})*(g_1 + g_2*\ \frac{T}{2}*(\frac{1+z^{-1}}{1-z^{-1}})) =$$

$$g_0 + \frac{T}{2}*(\frac{1+z^{-1}}{1-z^{-1}}) * \ \frac{g_1 + g_2*\frac{T}{2} + (-g_1 + g_2*\frac{T}{2})z^{-1}}{1 - z^{-1}} =$$

$$\frac{g_0 + \frac{T}{2} * \left(g_1 + g_2*\frac{T}{2}\right) + (-2g_0 + 2g_2*\frac{T}{2} * \frac{T}{2})z^{-1} + \ (g_0 + \frac{T}{2} * \left(-g_1 + g_2*\frac{T}{2}\right))z^{-2}}{1 - 2z^{-1} + z^{-2}}$$

Because z-transfer function can always be represented as the ratio of two polynomials in z, we can write for 2nd order filter:

$$H(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{1 + a_1 z^{-1} + a_2 z^{-2}}$$

This give us following coefficients:

$$b_0 = g_0 + \frac{T}{2} * \left(g_1 + g_2*\frac{T}{2}\right)$$

$$b_1 = -\ 2g_0\ +2g_2*\frac{T}{2}*\frac{T}{2}$$

$$b_2 = g_0 + \frac{T}{2} * \left(-g_1 + g_2*\frac{T}{2}\right)$$

$$a_1 = -2, a_2 = 1$$