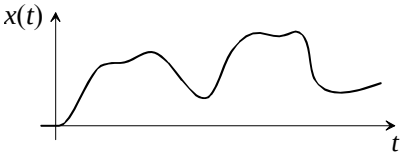
POVZETEK

Kategorizacije:

- časovno zvezni
- časovno diskretni
- amplitudno zvezni
- amplitudno diskretni
- periodični
- aperiodični
- močnostni
- energijski

Časovno zvezni signali in sistemi



Fourierjeva vrsta

$$X_k = \frac{1}{T}\int_{\tau}^{T+\tau} x(t)e^{-jk\omega_0 t}dt\,;k=-\infty...\infty$$

Parsevalov izrek:

$$P_x = \frac{1}{T}\int_{\tau}^{T+\tau} x^2(t)\,dt = \sum_{k=-\infty}^{\infty}|X_k|^2$$

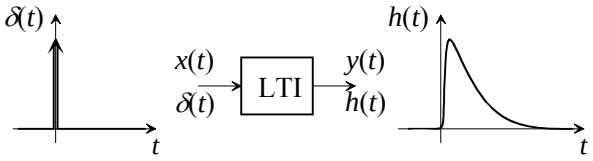
Fourierjeva transformacija

$$X(\omega) = \int_{-\infty}^{\infty} x(t)e^{-j\omega t}dt$$

Parsevalov izrek:

$$E_x = \int_{-\infty}^{\infty} x^2(t)\,dt = \frac{1}{2\pi}\int_{-\infty}^{\infty}|X(\omega)|^2\,d\omega$$

LTI sistemi – konvolucija

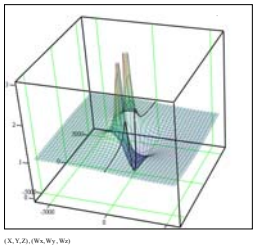


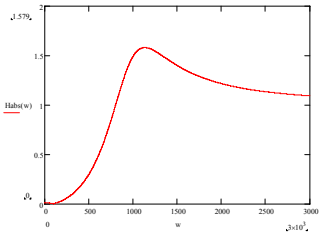
$$y(t) = x(t)*h(t) = h(t)*x(t) =$$

$$= \int_{-\infty}^{\infty} x(\tau)h(t-\tau)\,d\tau = \int_{-\infty}^{\infty} h(\tau)x(t-\tau)\,d\tau$$

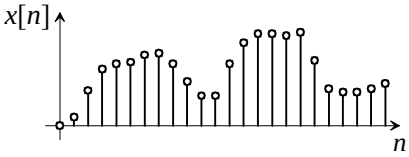
Sistemska funkcija $H(s)$

$$H(s) = \frac{Y(s)}{X(s)} = K\frac{(s-n_1)(s-n_2)\cdots(s-n_k)}{(s-p_1)(s-p_2)\cdots(s-n_m)}$$





Časovno diskretni signali in sistemi



DFS

$$X_k = \frac{1}{N}\sum_{n=0}^{N-1} x[n]e^{-j\frac{2\pi}{N}k\cdot n}\;;k=0...N-1$$

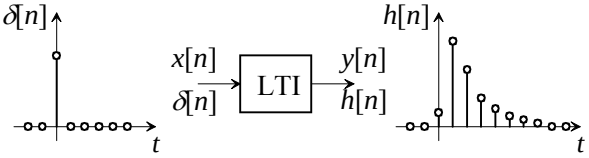
DtFT

$$X(\Omega) = \sum_{n=-\infty}^{\infty} x[n]e^{-j\Omega\cdot n}$$

DFT

$$X[k] = \sum_{n=0}^{N-1} x[n]e^{-j\frac{2\pi}{N}k\cdot n}\;;k=0...N-1$$

Časovno diskretni LTI sistemi – diskretna konvolucija

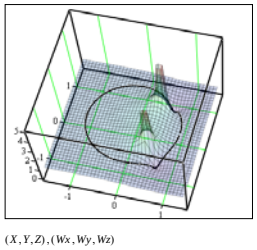


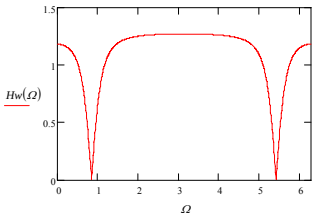
$$y[n] = x[n]*h[n] = h[n]*x[n] =$$

$$= \sum_{i=-\infty}^{\infty} x[i]h[n-i] = \sum_{i=-\infty}^{\infty} h[i]x[n-i]$$

Sistemska funkcija $H(z)$

$$H(z) = \frac{Y(z)}{X(z)} = K\frac{(z-n_1)(z-n_2)\cdots(z-n_k)}{(z-p_1)(z-p_2)\cdots(z-n_m)}$$





VZORČENJE, REKONSTRUKCIJA