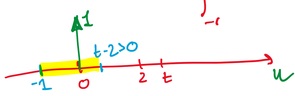
Le8

Wednesday, 13 March 2024 22:55

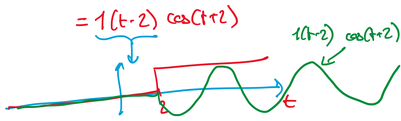
Es $y(t) = \begin{cases} 0 & t \le 2 \\ \cos(t+2) \int_{-1}^{t-2} x(u)\,du & t > 2 \end{cases}$



3) BIBO STABILE?
4) RISPOSTA IMPULSIVA $h(t)$
5) RISPOSTA AL GRADINO $h_{-1}(t)$

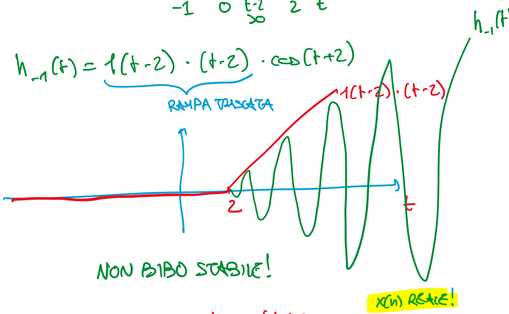
$h(t) = \begin{cases} 0 & t \le 2 \\ \cos(t+2) \int_{-1}^{t-2} \delta(u)\,du = 1 & t > 2 \end{cases}$

$= 1(t-2)\cos(t+2)$



$h_{-1}(t) = \begin{cases} 0 & t \le 2 \\ \cos(t+2) \int_{-1}^{t-2} 1(u)\,du & t > 2 \end{cases}$

$h_{-1}(t) = 1(t-2)\cdot(t-2)\cdot\cos(t+2)$ — RAMPA TRASLATA



NON BIBO STABILE!

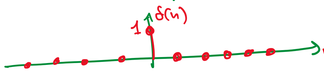
Es $y(n) = \begin{cases} \text{sign}\left(\frac{1}{x(n)}\right) & x(n) \neq 0 \\ 0 & x(n) = 0 \end{cases} = f(x(n))$

x(n) REALE! — PRESENTE!

$f(u) = \begin{cases} \text{sign}\left(\frac{1}{u}\right) & u \neq 0 \\ 0 & u = 0 \end{cases}$

1) CAUSALITA'? TRASF. ISTANTANEA → CAUSALE
2) TEMPO INVARIANTE? → $f(x(n-n_0)) \overset{?}{=} f(x(n-n_0))$ TEMPO INVARIANTE
3) BIBO STABILITA'? SI
4) RISPOSTA IMPULSIVA
5) LINEARITA'? NO

$h(n) = \begin{cases} \text{sign}\left(\frac{1}{\delta(n)}\right) & \delta(n) \neq 0 \\ 0 & \delta(n) = 0 \end{cases}$ — non lineare



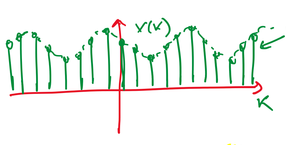
$h(n) = \begin{cases} 1 & n = 0 \\ 0 & n \neq 0 \end{cases} = \delta(n)$

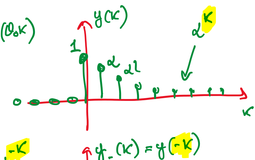
Es CALCOLARE $z(n) = x * y(n)$

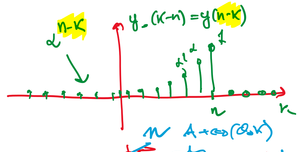
con $x(n) = A + \cos(\theta_0 n)$

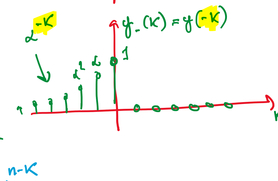
$y(n) = 1_0(n)\,\alpha^n$, α reale, $|\alpha| < 1$

$$z(n) = \sum_{k=-\infty}^{+\infty} x(k)\,y(n-k) = \sum_{k=-\infty}^{+\infty} x(k)\,y_-(k-n)$$









$$z(n) = \sum_{k=-\infty}^{+\infty} x(k)\,y(n-k)\,\alpha^{n-k}$$ — $x(k)$: $A + \cos(\theta_0 k)$

$$= \sum_{k=-\infty}^{n} \left(A + \cos(\theta_0 k)\right)\alpha^{n-k}$$

$$= \sum_{k=-\infty}^{n} \left(A + \frac{1}{2}e^{j\theta_0 k} + \frac{1}{2}e^{-j\theta_0 k}\right)\alpha^{n-k} \qquad m = n-k$$

$$= \sum_{m=0}^{+\infty} \alpha^m \left(A + \frac{1}{2}e^{j\theta_0(n-m)} + \frac{1}{2}e^{-j\theta_0(n-m)}\right)$$