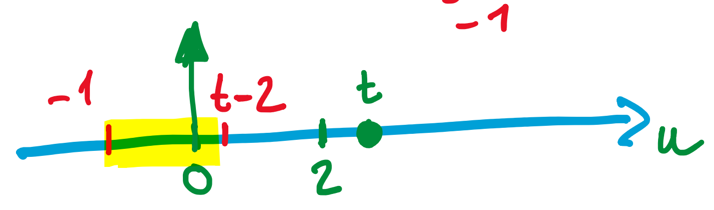
Le08

Thursday, 13 March 2025 00:00

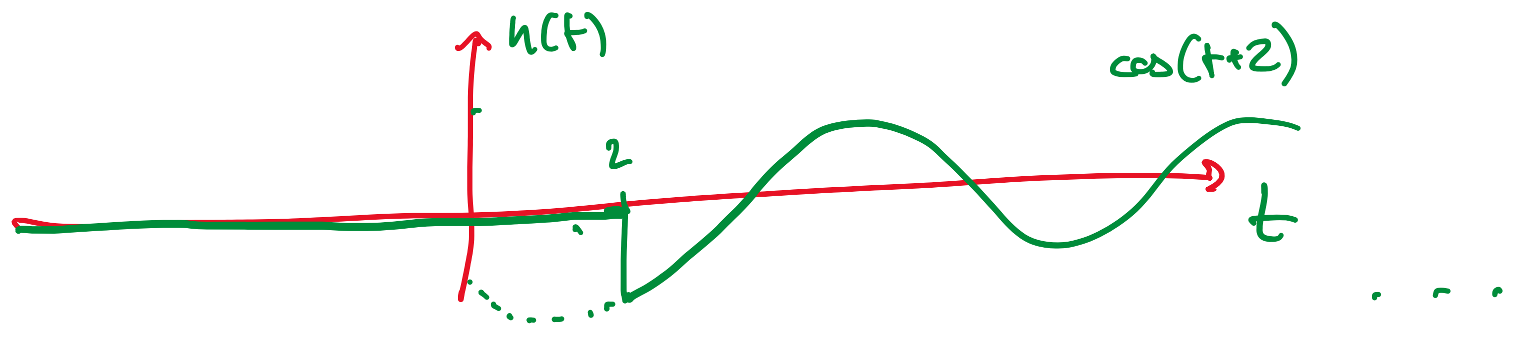
Es 1

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



1) CAUSALE sì
2) LINEARE sì perché combinazione di operazioni lineari
3) BIBO STABILE NO
4) RISPOSTA IMPULSIVA $h(t)$
5) RISPOSTA AL GRADINO $h_{-1}(t)$
6) TEMPO-INVARIANTE NO

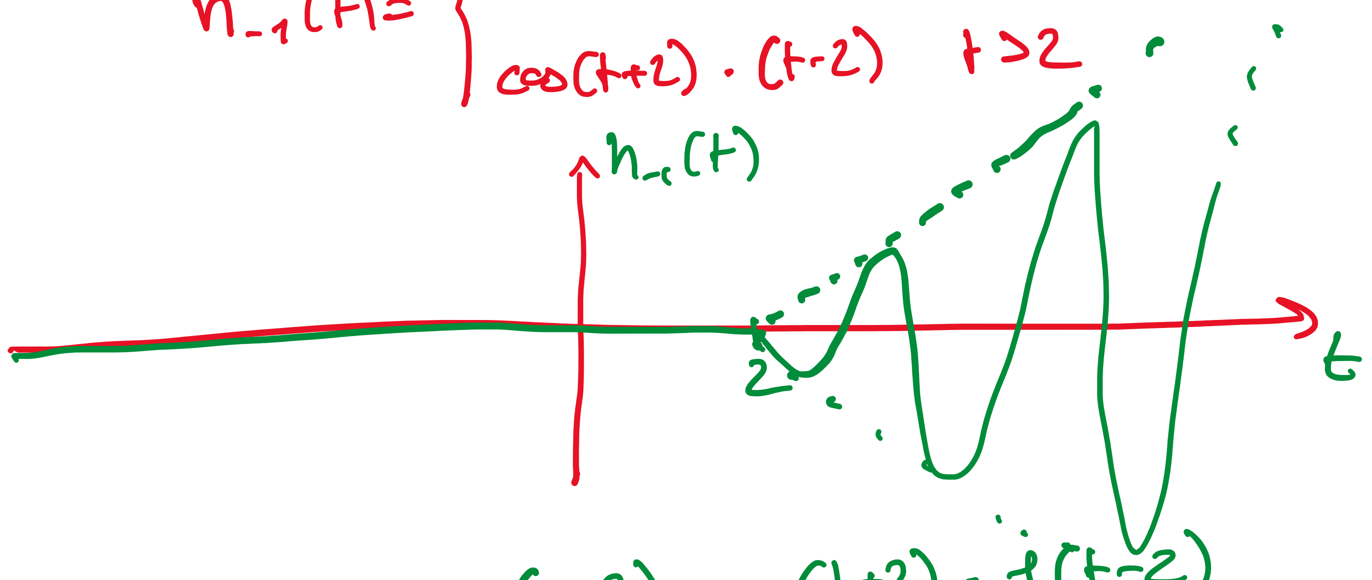
$$h(t)=\begin{cases}0 & t\le 2\\ \cos(t+2)\underbrace{\cancel{\int_{-1}^{t-2}\delta(u)\,du}}_{1} & t>2\end{cases}$$



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

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

$$h_{-1}(t)=\begin{cases}0 & t\le 2\\ \cos(t+2)\cdot(t-2) & t>2\end{cases}$$



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

$$y(t-t_0)=\begin{cases}0 & t-t_0\le 2\\ \cos(t-t_0+2)\int_{-1}^{t-t_0-2}x(u)\,du & t-t_0>2\end{cases}$$

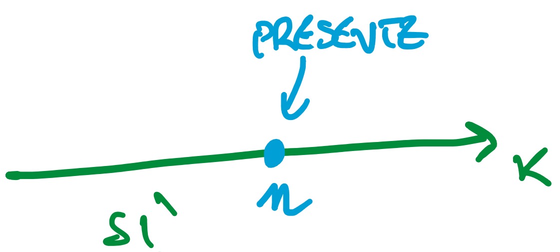
$$\Sigma[x(t-t_0)]=\begin{cases}0 & t\le 2\\ \cos(t+2)\underbrace{\int_{-1}^{t-2}x(\underbrace{u-t_0}_{v})\,du}_{\int_{-1-t_0}^{t-2-t_0}x(v)\,dv} & t>2\end{cases}$$

Es 2

$$y(n)=\begin{cases}\operatorname{sign}(1/x(n)) & x(n)\neq 0\\ 0 & x(n)=0\end{cases}=f(x(n))$$

TRASF. ISTANTANEA

STATICA



1) CAUSALE sì
2) TEMPO-INVARIANTE sì
3) BIBO STABILE sì
4) RISPOSTA IMPULSIVA
5) LINEARE NO

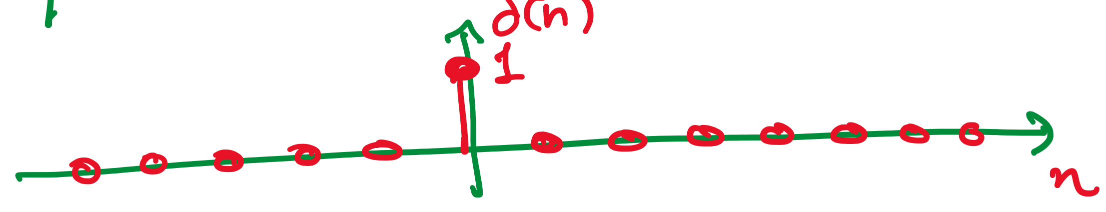
$$y(n-n_0)=f(x(n-n_0))$$

$$\Sigma[x(n-n_0)]=f(x(n-n_0))$$

$y(n)\in\{0,1,-1\}$ LIMITATI

$$|y(n)|\le\begin{cases}\left|\operatorname{sign}\left(\frac{1}{x(n)}\right)\right|=1 & x(n)\neq 0\\ 0 & x(n)=0\end{cases}\le 1$$

$$g(n)=\begin{cases}\operatorname{sign}(1/\delta(n)) & \delta(n)\neq 0\\ 0 & \delta(n)=0\end{cases}$$



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