Esercitazioni Controllo Digitale

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Esercitazione 3: SISOTOOL

Dato il sistema avente funzione di trasferimento:

$$G(s) = \frac{10}{0.1s^2 + 1.1s + 1}$$

1. Progettare un controllore C(s) tale che il sistema controllato:
    1. Insegua un setpoint a scalino con un errore asintoticamente nullo
    2. Abbia una massima sovraelongazione del 10%
    3. Arrivi a regime in un tempo di 1s
2. Simulare il sistema controllato

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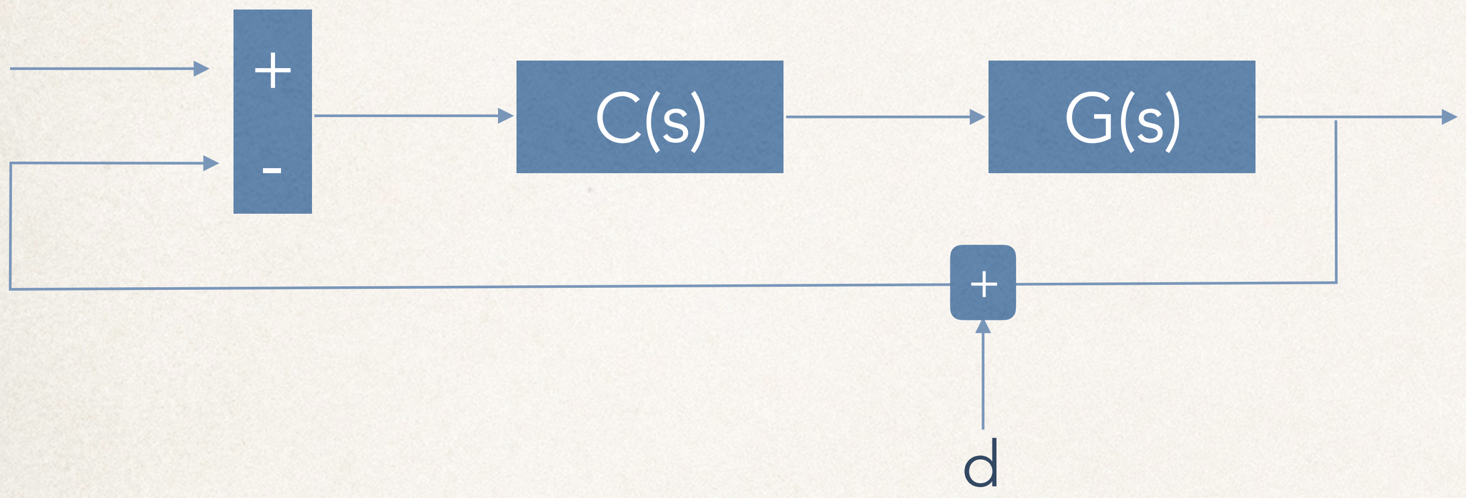

Tempo	$L(s)$	$G_{cl}(s) = \frac{L(s)}{1+L(s)}$
e_∞=0 su ingresso a scalino	$L = \frac{1}{s}\widetilde{L}(s)$	$G_{cl}(0) = 1$

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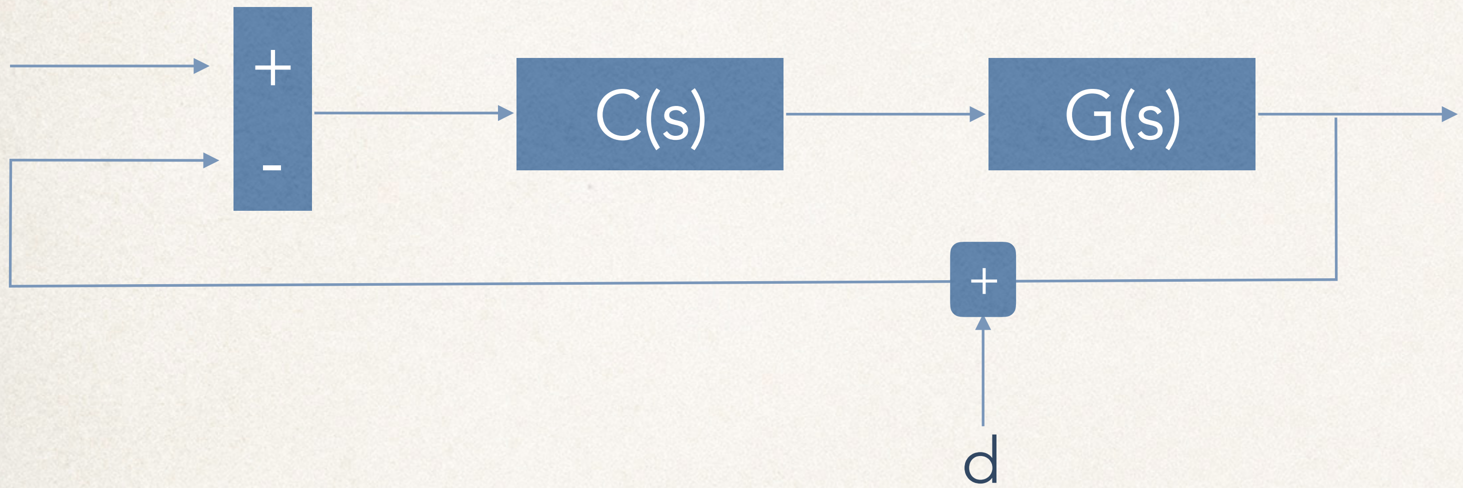

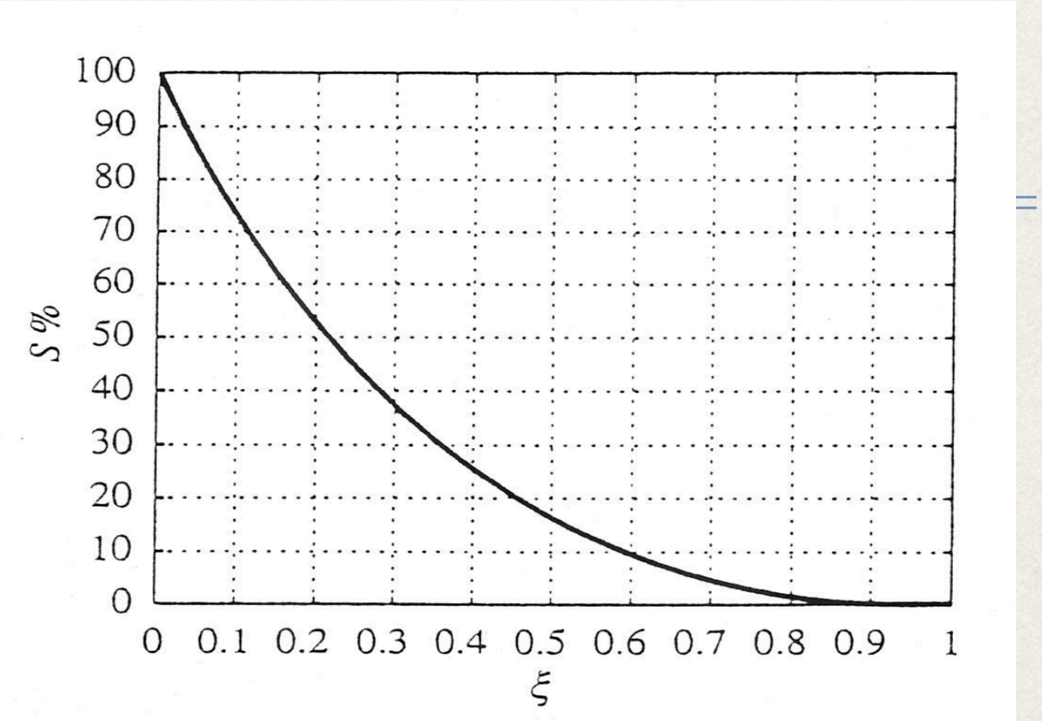

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$S\% < \bar{S}$	$PM = 100\xi$	$G_{cl} \simeq= \mu\frac{\omega_n}{s^2+2\xi\omega_n+\omega_n^2}$

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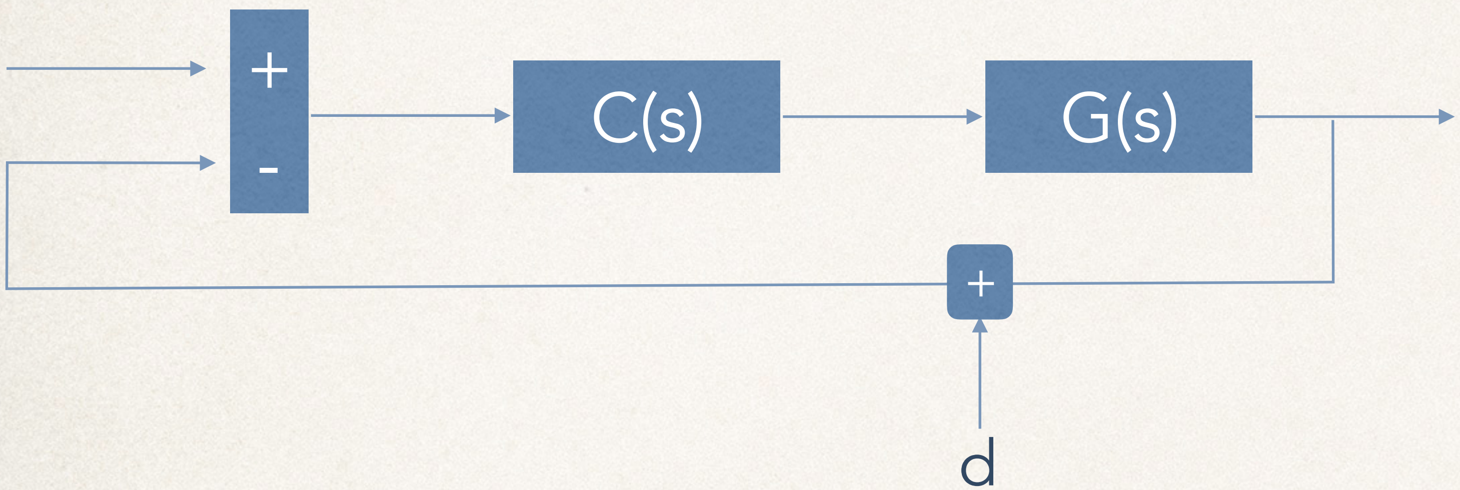

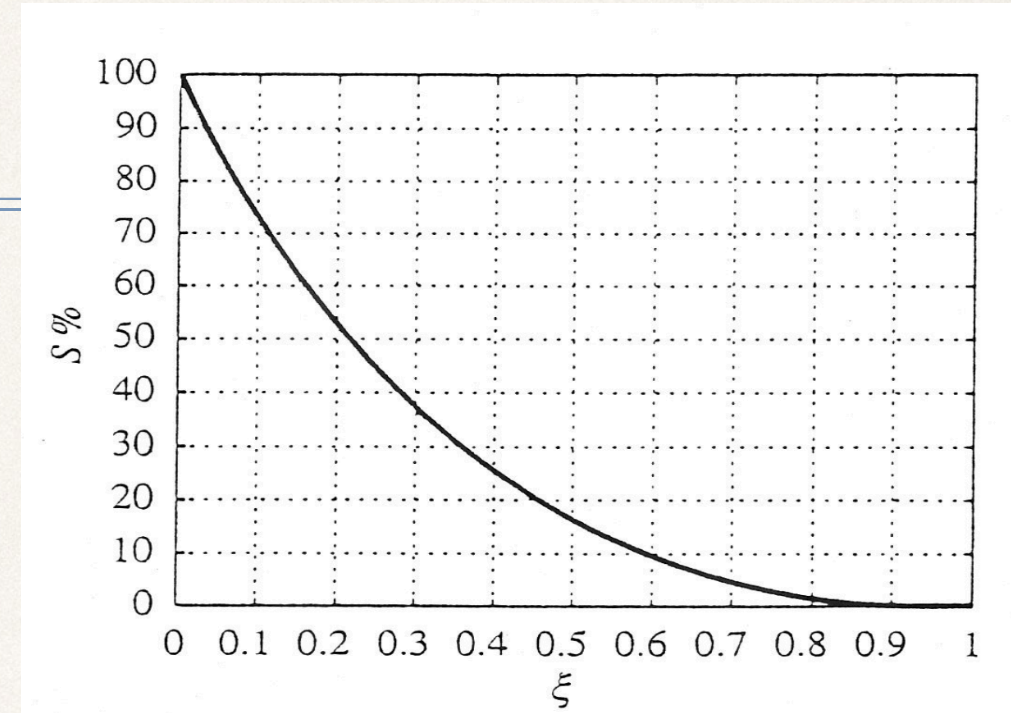

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$Ta_2 \leq \bar{T}$	$\omega_t \geq \bar{\omega}_t$ Se $PM > 75,\ \omega_t \simeq \frac{5}{\bar{T}}$ Se $PM < 75,\ \omega_t = \omega_n$	$\bar{T} \simeq \frac{4}{\xi\omega_n}$ $\omega_n \simeq \frac{4}{\xi\bar{T}}$

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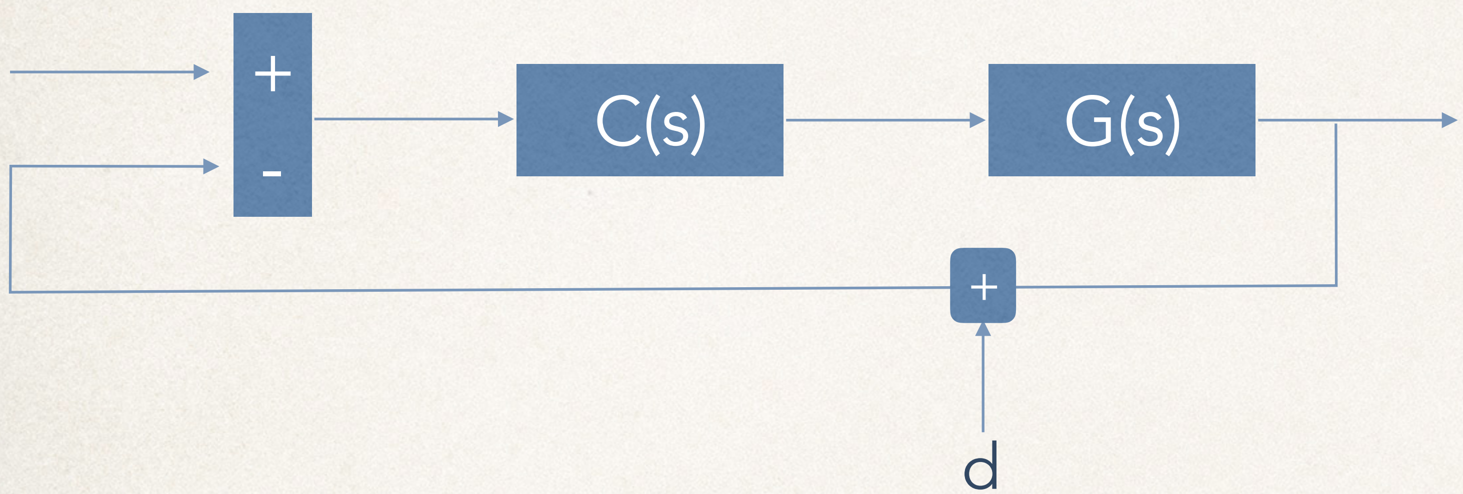

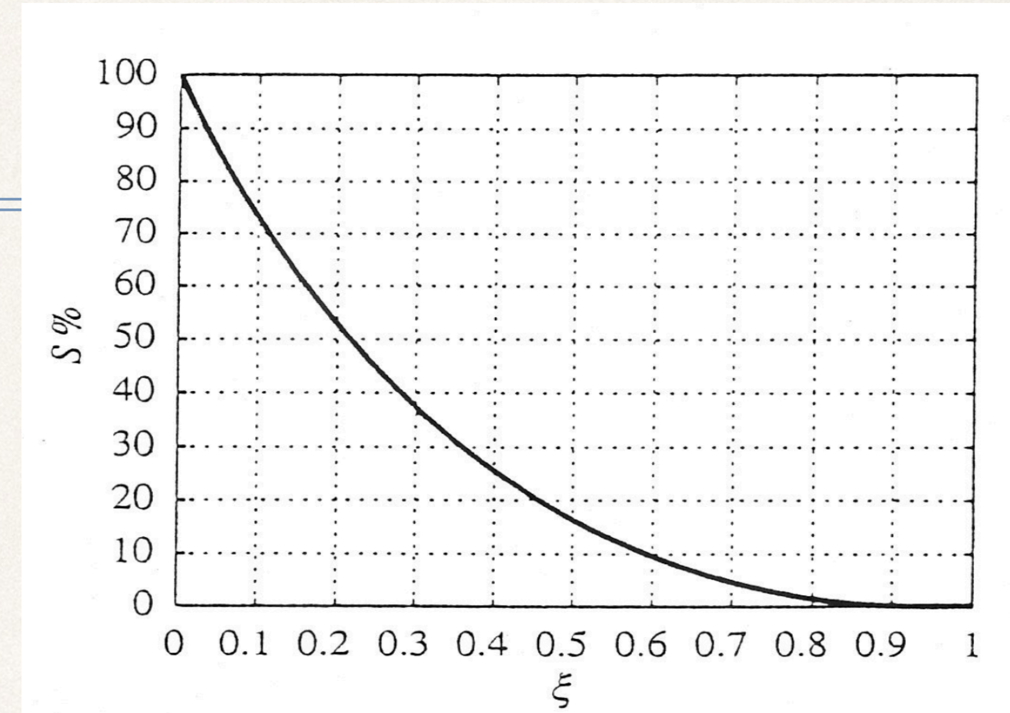

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Disturbo d su linea di retroazione a pulsazione ω_d attenuato di X dB	$\mid L(j\omega) \mid\leq X$ per $\omega \geq \omega_d$	$\mid G_{cl}(j\omega) \mid\leq X$ per $\omega \geq \omega_d$