Notes in ECEN 5448

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Lecture

combining different things to get a nice triangle function.

$$H_{\text{tri}}(z) = \frac{z^2 - 2z + 1}{Tz} \mathfrak{Z}\left(\frac{H(s)}{s^2}\right)$$

if $D(s)$ is causal then $D(z)$ should be causal.

design in continuous domain and then convert to discrete. This will work sometimes, but it is often better to directly make a discrete controller.

rlocus review:

- $H(s)$ has phase -180 on the locus.
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1. Mark poles and zeros of H(s)
2. segments of the real axis to the left of an odd number of poles and zeros are on the locus
3. sketch asymptotes as $K \to \infty$, $\alpha = \dfrac{\sum p_i - \sum z_i}{n - m}$ and $l = \dfrac{180 + 360(l-1)}{n-m}$ and $l = 1, 2, \ldots, n - m$. n=number of poles and m=number of zeros.
4. determine the departure and arrival angles from poles and zeros. q is multiplicity of poles and zeros. $\phi_{\text{dep}} = \frac{1}{q}(\sum \psi_i - \sum \phi_i - 180 - 360 * l)$ and $\psi_{\text{arr}} = \frac{1}{q}(\sum \phi_i + \sum \psi_i + 180 + 360 * l)$.