Home Work #6

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December 14, 2021

1 Question 1

System is:

$$G(s) = \frac{-s+3}{(s+1)(s+2)(s^2+2s+4)}$$

1.1 part a

We used get_fog and opt_app to find first order time delay transfer function (FOTF).

- frequency

$$G(s) = e^{-1.45*s}\frac{0.375}{0.9587s+1}$$

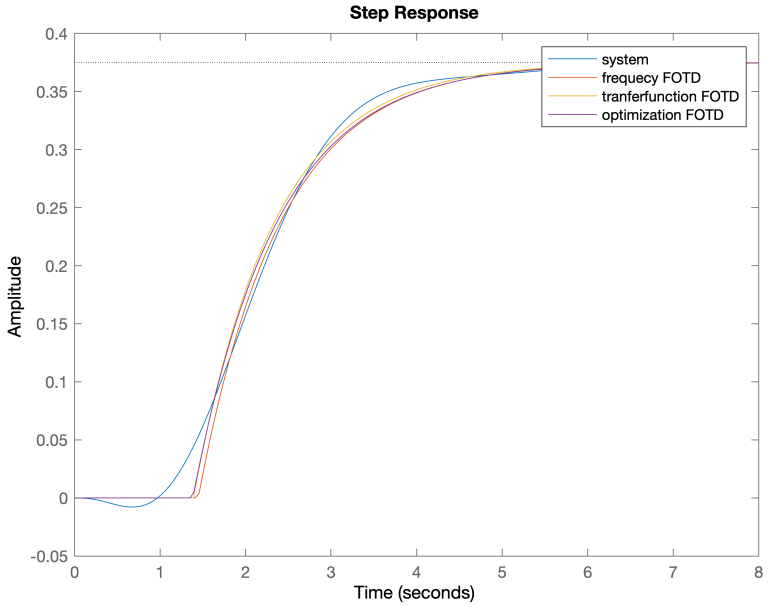
- transfer function

$$G(s) = e^{-1.39*s}\frac{0.375}{0.9428s+1}$$

- optimum

$$G(s) = e^{-1.38*s}\frac{0.383}{s+1.021}$$

Figure 1: system and FOTD step responde



I used below cost function to see witch one fits better.

$$\text{Cost} = \int_0^8 |G(t) - G'(t)|dt, \qquad G' \text{ is FOTD transfer function}$$

- frequency
  Cost = 1.5949
- transfer function
  Cost = 1.3208
- optimum
  Cost = 1.0345

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