Day 31

Planning

AE353

Spring 2022

Bretl

TRACKING

$$\dot{m} = f(m,n)$$
$$o = g(m,n)$$

$$m = \begin{bmatrix} p_x \\ p_y \\ p_z \\ \psi \\ \theta \\ \phi \\ \vdots \end{bmatrix} \qquad n = \begin{bmatrix} T_x \\ T_y \\ T_z \\ f_z \end{bmatrix}$$

$$\dot{x} = Ax + Bu$$
$$y = Cx$$

$$x = m - m_e$$
$$u = n - n_e$$
$$y = o - g(m_e, n_e)$$

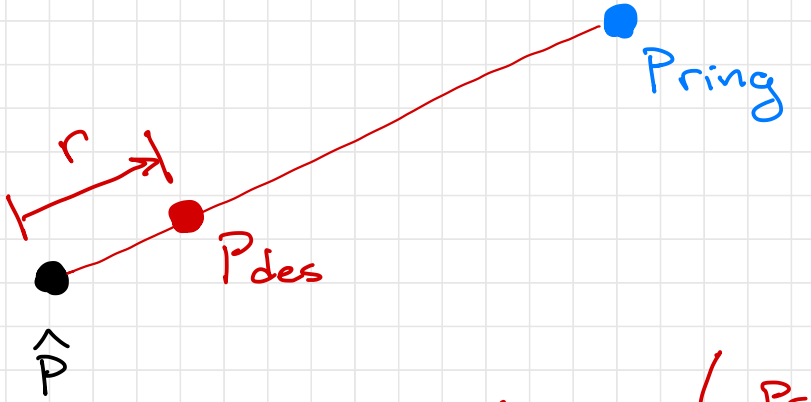
$$u = u_{des} - K(\hat{x} - x_{des})$$
$$\dot{\hat{x}} = A\hat{x} + Bu - L(C\hat{x} - y)$$

$$x_{des} = \bar{m}_e - m_e$$
$$u_{des} = \bar{n}_e - n_e$$

$$\left.\frac{\partial f}{\partial m}\right|_{(m_e, n_e)} = \left.\frac{\partial f}{\partial m}\right|_{(\bar{m}_e, \bar{n}_e)}$$

$$A = \bar{A}$$
$$B = \bar{B}$$
$$C = \bar{C}$$

How to choose x_{des} and u_{des}?



$$P_{des} = \hat{P} + r\left(\frac{P_{ring} - \hat{P}}{\| P_{ring} - \hat{P} \|}\right)$$

$$\dot{m}(t) = f(m(t), n(t))$$

$$\dot{m}_e(t) = f(m_e(t), n_e(t))$$

$$\dot{x}(t) = A(t)\, x(t) + B(t)\, u(t)$$

$$x(t) = m(t) - m_e(t)$$

$$u(t) = n(t) - n_e(t)$$