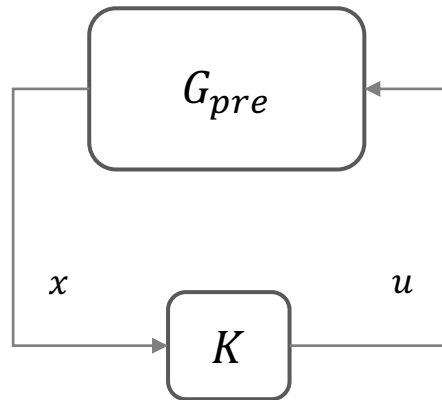


- Consider about RL for stabilizable system LQR

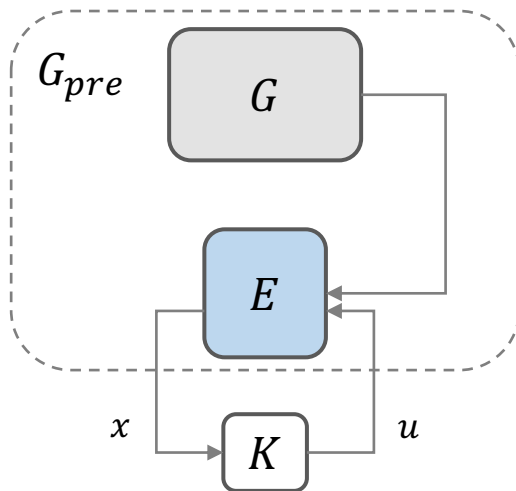


$$\begin{cases} x_{t+1} = Ax_t + Bu_t \\ u_t = Kx_t \end{cases}$$

G_{pre} is stabilizable

- Find optimal feedback gain K_{opt}
 - Unknown : system and cost matrix A, B, Q, R
 - Known : instantaneous cost $c(x_t, u_t)$, and state x
- Since RL needs exploration, we add exploration noise to input like $u = Kx + e$
- But in uncontrollable case, enough exploration cannot be done

- Consider about RL for stabilizable system LQR
 - Motivation : Optimize G_{pre} , but can control only E



$$\min \sum_{t=0}^{\infty} (x^T R x + u^T Q u), s.t. u = Kx$$

$$G_{pre} : x = \begin{pmatrix} x_g \\ x_e \end{pmatrix}$$

x_g : uncontrollable (but stable)

x_e : controllable

Weekly Report

M2 Ibuki Takeuchi

- Colloquium
 - Reinforcement Learning for LQR of stabilizable system

(If could...)

- Also talk about :
 - Optimal control for stochastic system
 - Adaptive filter