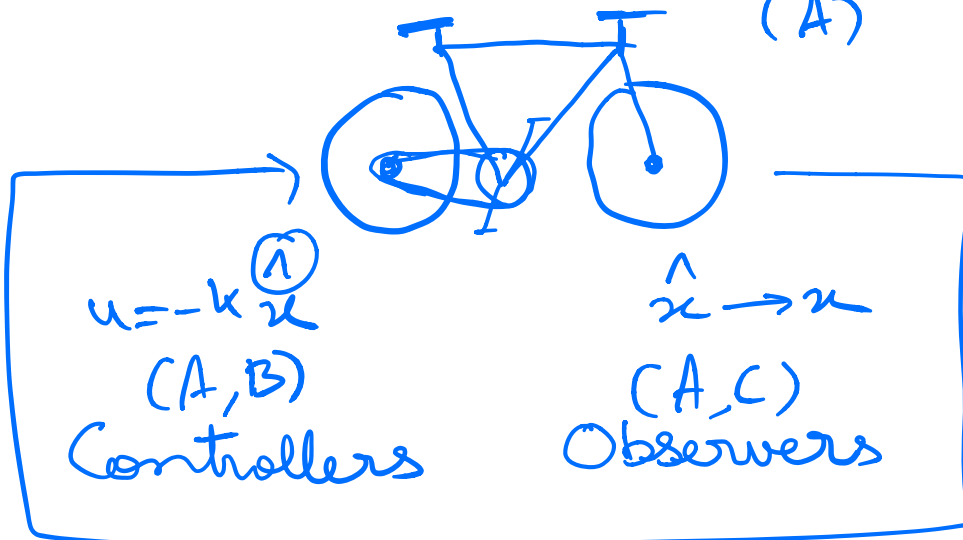


10.10.2019

ELL333

stability/dynamics?  
(A)

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



$$\dot{\hat{x}} = A\hat{x} + L(y - C\hat{x})$$

FEEDBACK

Controllability

Observability

- Can controllers &/ observers be designed? → rank tests
- Design using eigenvalue assignment

$A - BK$

$A - LC$

- Gain matrices that have to be chosen

Often, there are competing objectives

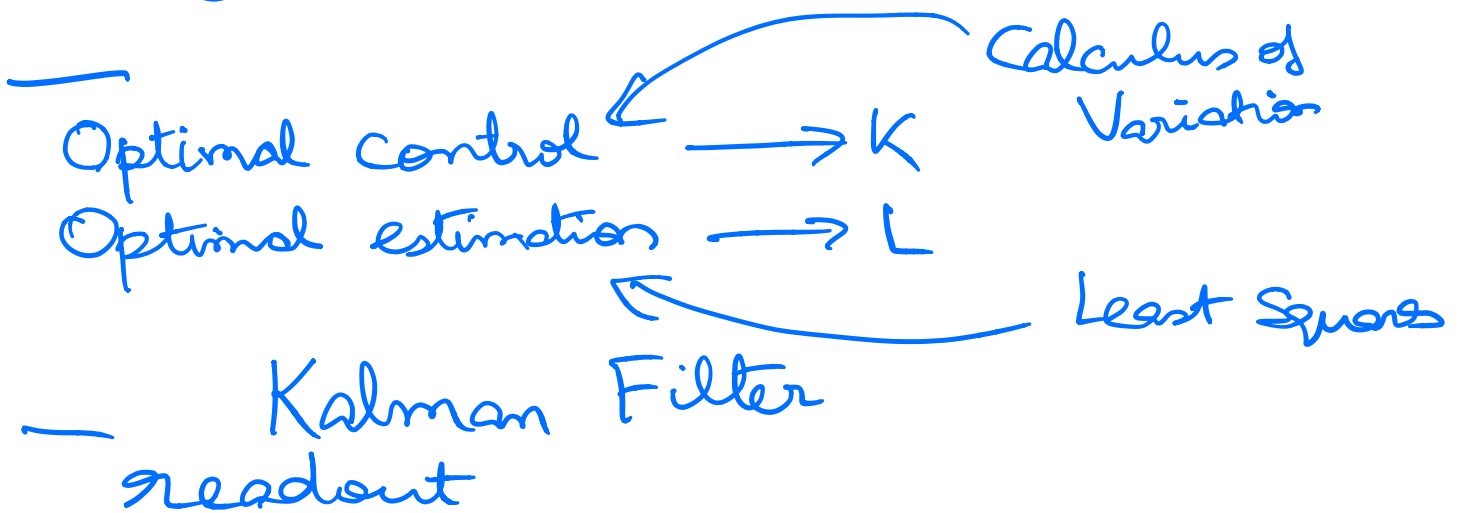
- fast response vs minimum control effort (controller)

- fast response vs noise minimization  
(Observer)

—  
○ Optimize and chose gains

Optimization

- least square
- evolution (cost?)



## Quiz 9

Write a short paragraph on  
Kalman Filter.