

CMPE 240 office hours

3/FEB/2016

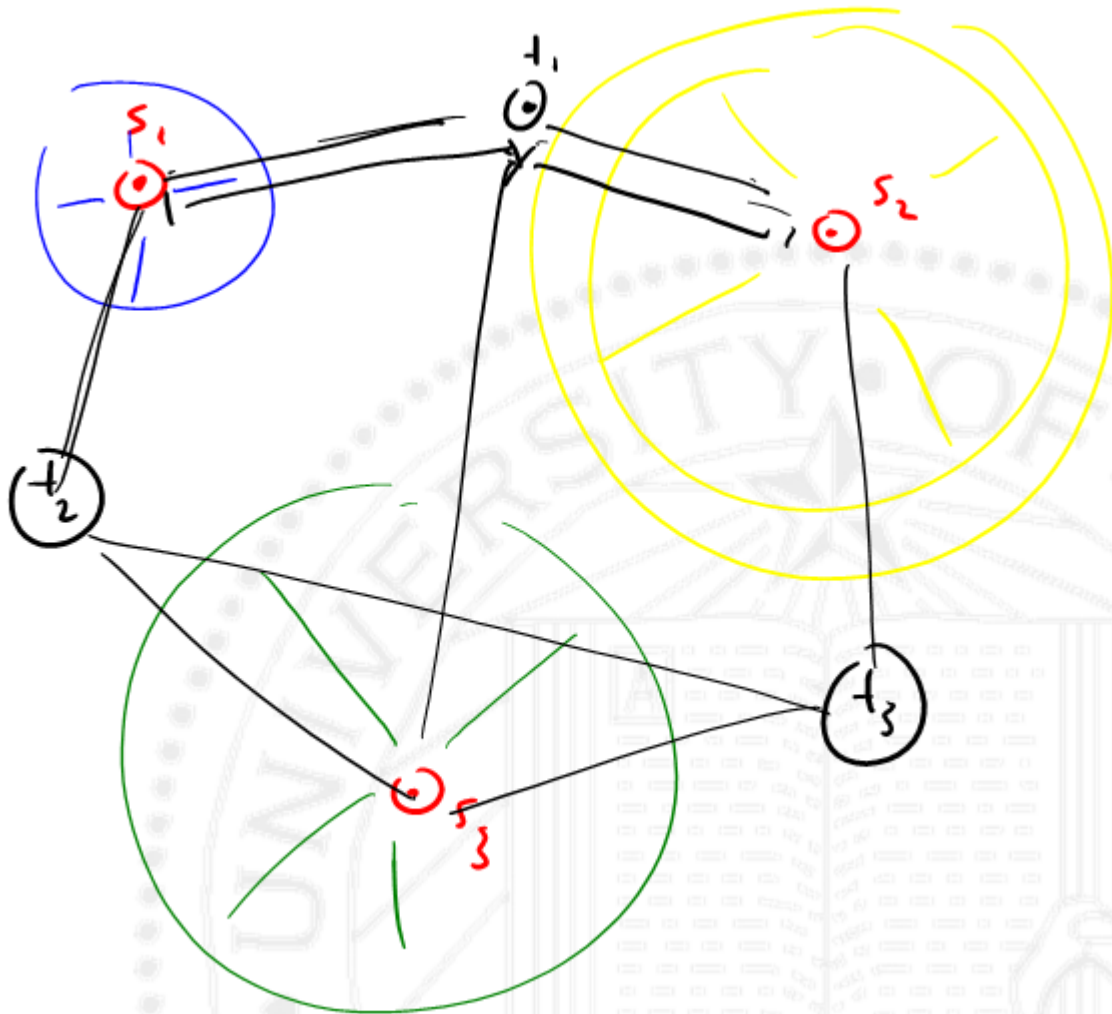
$s_1 \dots s_n \in \mathbb{R}^2$ (x, y) coords of sources

x_j emission rate of source j

$t_1 \dots t_m$ — means of known spots (dewers)

source $j \rightarrow$ weight $i \rightarrow \frac{\alpha x_j}{\|s_j - t_i\|^2}$





3 sources + 10 sensors 1 of the 10 sensors is faulty.

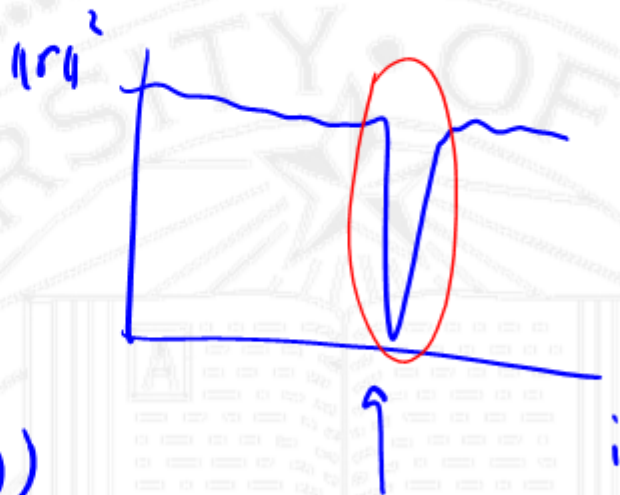
$$\hat{x} = (\tilde{K} + K)^{-1} \tilde{K}^T y \quad \tilde{K} \in \mathbb{R}^{9 \times 3}$$

$$r_i = \| \tilde{K}_i x_i - y_i \|^2$$



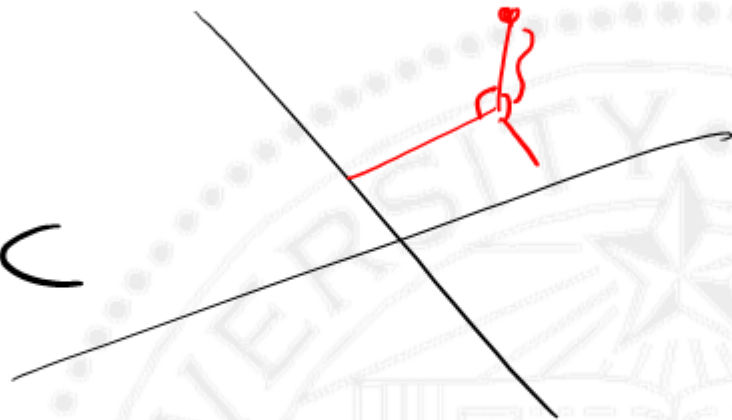
$$P_r(k) \quad (I - P_r(k))$$

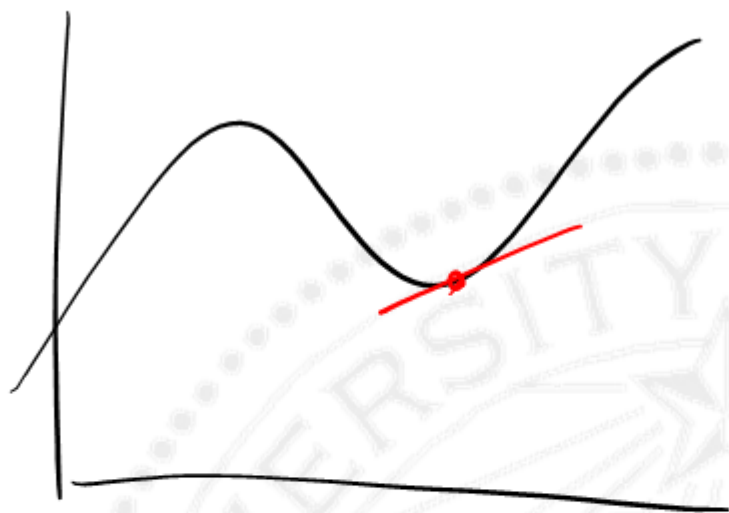
measurement



$$\|y - Ax\|_2^2$$

FDIC





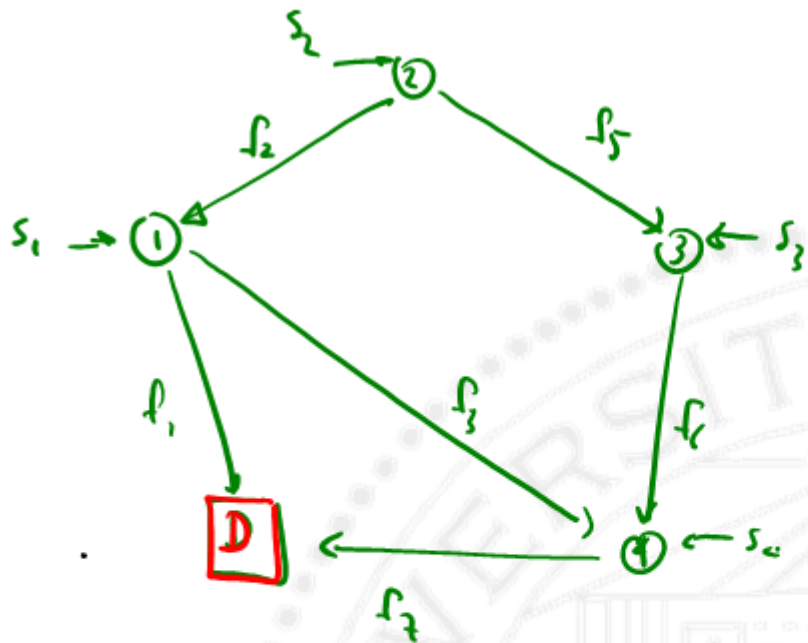
$$\dot{x} = Ax + Bu$$

$$\dot{x} = f(x, u)$$

$$A \hat{=} \frac{\partial f}{\partial x}$$

$$B \hat{=} \frac{\partial f}{\partial u}$$





$$\begin{bmatrix} 0 & -1 & 0 & -1 \end{bmatrix} p =$$

$$-f_2 - f_3 = -s_2$$

$$A p = -s$$

$$A \tilde{p} = b$$

$$s \in \mathbb{R}^m$$

$$s_i = \sum_{j=1}^n f_j^2$$

$$d_{ij} = \begin{cases} 1 & \text{if } i \text{ and } j \text{ are adjacent} \\ -1 & \text{if } i \text{ and } j \text{ are not adjacent} \\ 0 & \text{if } i = j \end{cases}$$

Data in ..



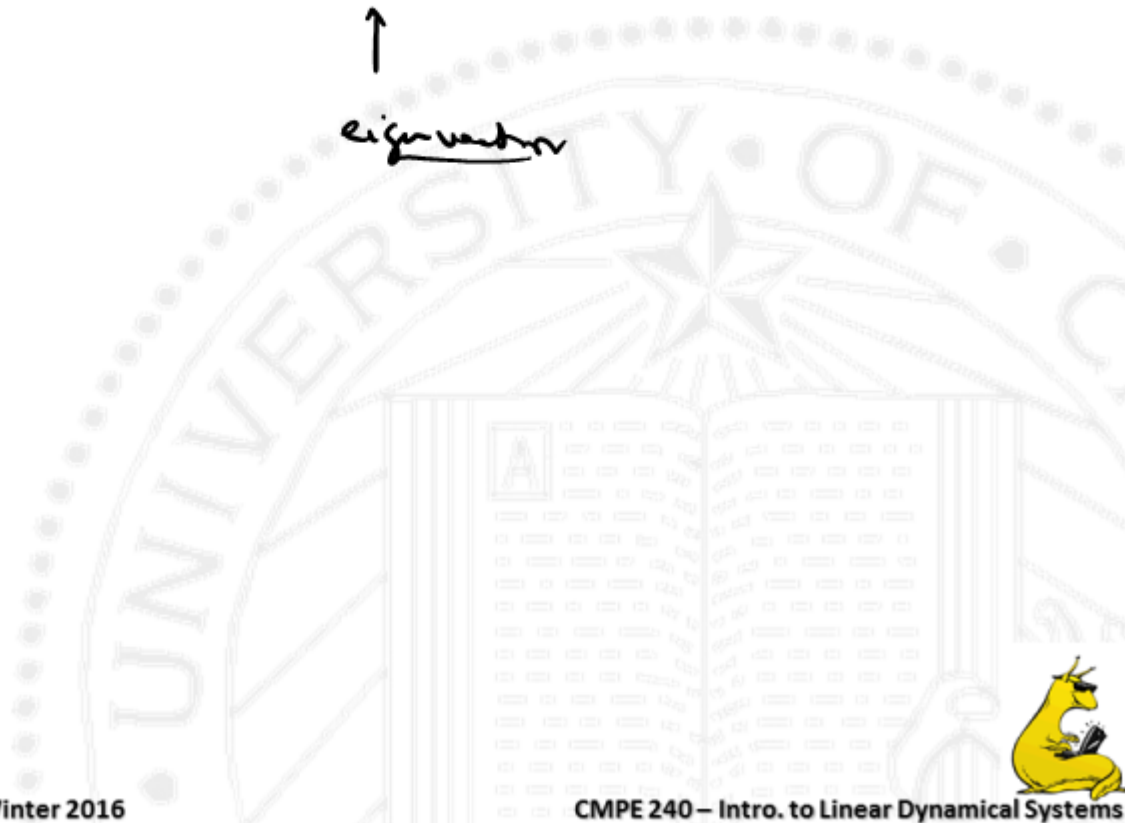
$\text{eig}(A) :$

$$Ax = \lambda x$$



eigenvector

eigenvalue



②

$$y_i = a_i^T x + v_i$$

↑
noise

$$Y = \underbrace{\begin{bmatrix} A & \mathbf{1} & \mathbf{1} \\ & \mathbf{1} & \mathbf{1} \\ & & \mathbf{1} \end{bmatrix}}_{\tilde{A}} \begin{bmatrix} X \\ \alpha \\ \beta \end{bmatrix} + W$$

$$v_i = \alpha + \beta(iT) + \omega_i$$

↑
 $N(0, \sigma)$

$$y_i = a_i^T x + \alpha + \beta(iT) + \omega_i$$

$$\begin{bmatrix} y_1 \\ \vdots \\ y_m \end{bmatrix} = \begin{bmatrix} A \\ \vdots \\ A \end{bmatrix} x + \begin{bmatrix} \vdots \\ \vdots \\ \vdots \end{bmatrix} \alpha + \begin{bmatrix} \mathbf{1}^T \\ 2T \\ \vdots \\ mT \end{bmatrix} \beta + \begin{bmatrix} \omega_1 \\ \vdots \\ \omega_m \end{bmatrix}$$

↑

