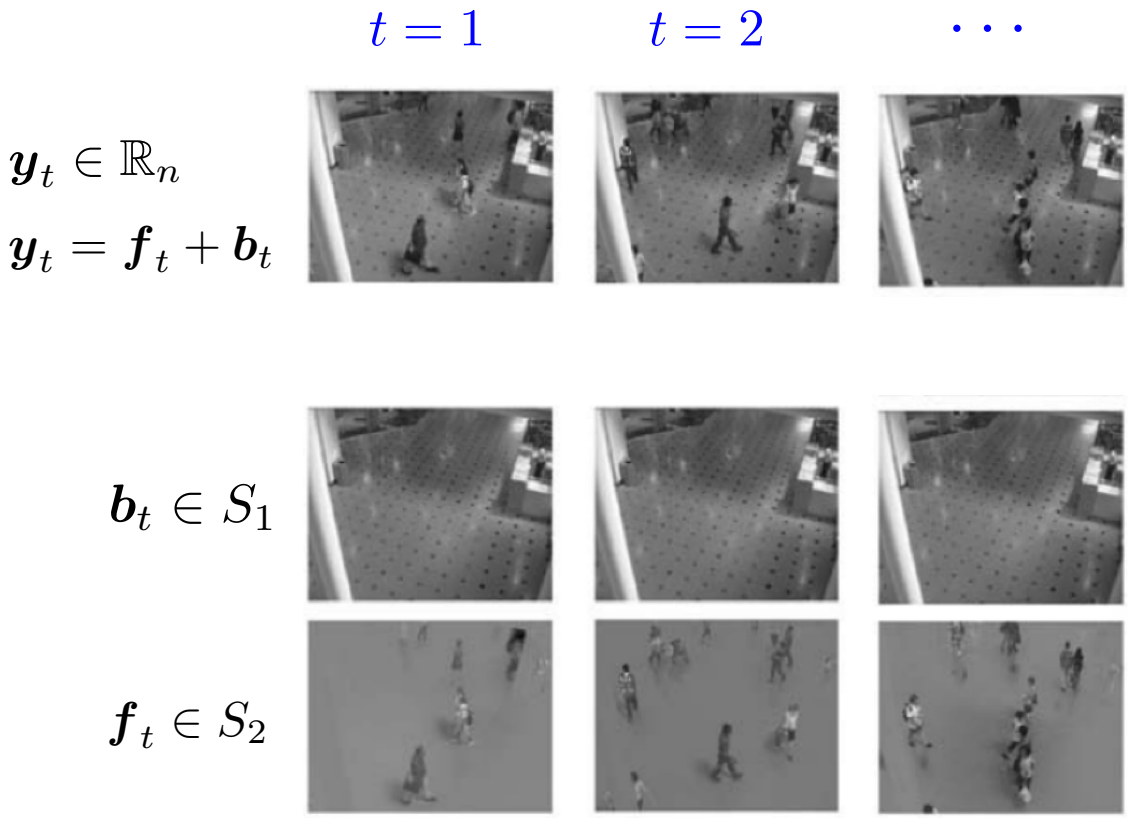
CS/ECE/ME 532
Period 5

Unit 1 Quiz Today (opens at 11:05, due at 11:30)

- Sit at your table, **video must be on**
- Open notes
- no interaction with anyone besides instructors
- last question requires writing on paper and scanning/submitting – check your pdf/image locally!

Unit 2 Video Topics

- Subspaces in Machine Learning
- Bases (i.e, taste vectors or patterns!)
- Approximate soln's to least squares problems



[He, Balzano, Lui, 2011]

Period 5 Activity

Subspaces

$S \subseteq \mathbb{R}^n$ is a subspace if:

1. $\mathbf{0} \in S$
2. if $\boldsymbol{x}, \boldsymbol{y} \in S$ then $\boldsymbol{x} + \boldsymbol{y} \in S$
3. if $\boldsymbol{x} \in S$ then $\alpha \boldsymbol{x} \in S$

Subspaces are *subsets* of $\mathbb{R}^n$ with these properties

Bases/Tastes profiles

Users →

Movie ↓

$$\begin{bmatrix} 4 & 7 & 2 & 8 & 7 \\ 9 & 3 & 5 & 6 & 10 \\ 4 & 8 & 3 & 7 & 6 \end{bmatrix} \approx \begin{bmatrix} t_{1,1} & t_{1,2} \\ t_{2,1} & t_{2,2} \\ t_{3,1} & t_{3,3} \end{bmatrix} \begin{bmatrix} w_{1,1} & \dots & w_{1,5} \\ w_{2,1} & \dots & w_{2,5} \end{bmatrix}$$

weights of user 1's preference for that taste 1

basis or taste vector

Do/Check your work in Python