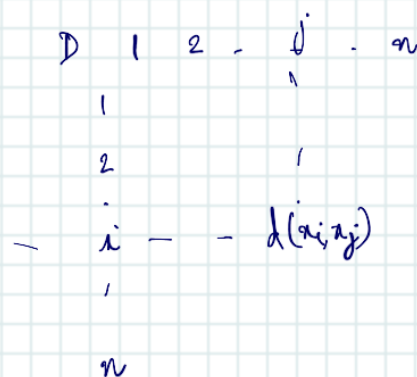
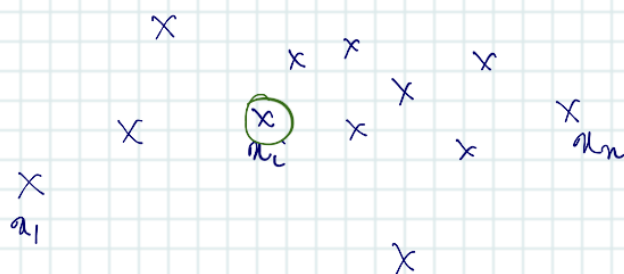


01/09/23

## Deep Learning

- Recap
- Course Project
- Stochastic Neighborhood Embedding (SNE)



- $X = \{x_1, x_2, \dots, x_n\}$  is the set of high-dim. datapoints

- $Y = \{y_1, y_2, \dots, y_n\}$  is the set of low dim. map points

### Problem:

- Given  $X$ , find an embedding that maps  $X$  to  $Y$  such that the local structure in  $X$  is preserved in  $Y$ .

- Outline of Solution:

- ① Compute pairwise distances on points in  $X$ . (and  $Y$ ) distance
- ② Convert distances to probabilities for  $X$  (and  $Y$ ). This assumes a prior on  $X$ .
- ③ Define a loss or cost function  $C$  that quantifies the distance between distributions. KL divergence
- ④ Minimize  $C$  with respect to  $y_i$ . Entropy