Multi-Dimensional Scaling

- Multi-dimensional scaling (MDS):
  - Directly optimize the final locations of the z_i values.
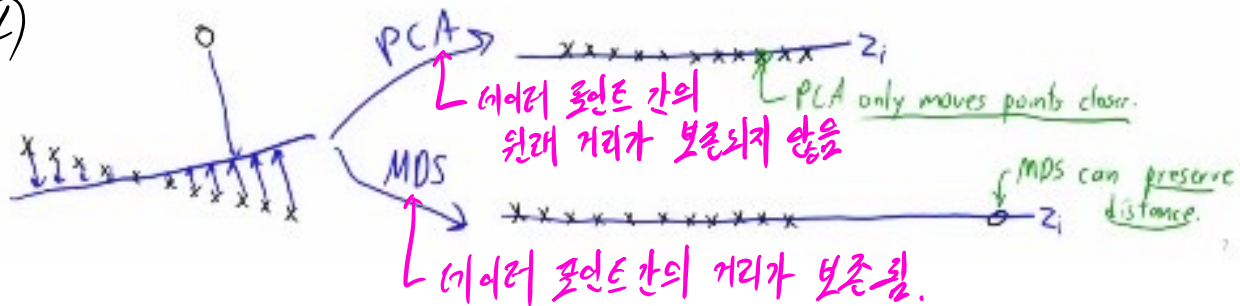
$$f(z) = \sum_{i=1}^{n} \sum_{j=i+1}^{n} \left(\|z_i - z_j\| - \|x_i - x_j\| \right)^2$$

  - Non-parametric dimensionality reduction and visualization:
    - No 'W': just trying to make z_i preserve high-dimensional distances between x_i.

① *mds의 목적.*

PCA   *PCA only moves points closer.*

에어러 포인트 간의 원래 거리가 보존되지 않음

MDS   *MDS can preserve distance.*

에어러 포인트 간의 거리가 보존됨.

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  - Non-parametric dimensionality reduction and visualization:
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② *PCA*   *z_i*

MDS   *z_i*