Transforming data using linear Algebra (L-3)

add more samples that mimics the original dataset

Matrix Transformation

Every given point in subspace is sum of basis vec

$$\begin{bmatrix} a \\ b \end{bmatrix} = a\begin{bmatrix} 1 \\ 0 \end{bmatrix} + b\begin{bmatrix} 0 \\ 1 \end{bmatrix} = a\hat{i} + b\hat{j}$$

$(a, b) \rightarrow$ also specify which subspace.

(a, b) might be diff in same 2D space.

$T0 \rightarrow$ original subspace

$T1 \rightarrow$ Transformed subspace.

T_1 matrix apply it on D in T_0.

Parallel lines $\rightarrow$ new basis vectors.

why?

Any transformation, changes into a new subspace

Dist-based algo (NN) changes on the transformed points.

Given an image $\rightarrow$ It gives description

Given a dataset we need to load dataset
extract features

get Hole pixels (i). sum (i) iterate over i.

colors → features plotted in 2d

we took existing training samples and applied transformations.

New basis can be determined through mathematical tools.

eigen vectors & eigen-values

Best transformation vector

Features: # of boundary pixels
# of hole pixels

If scale of features very diff
⇒ Normalization (setting offset)
(If scales are off)

i/p value → $\boxed{}$ → Normalized values.

(suppose we have (a,b) $\frac{x - min}{max - min}$

LHS x Transformation matrix $= \frac{x - min}{max - min}$

Scale it for any number of features

Bias vector : $\begin{cases} \frac{-min(x)}{max(x) - min(x)} \\ \frac{-min(y)}{max(y) - min(y)} \end{cases}$