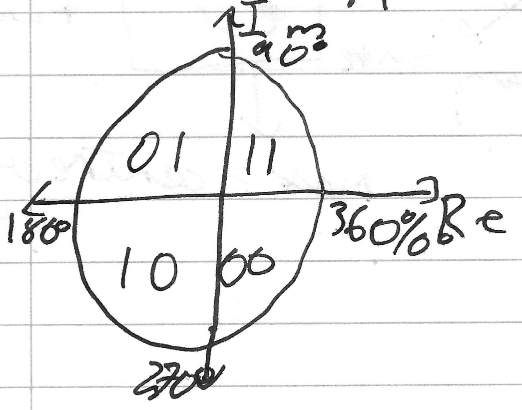
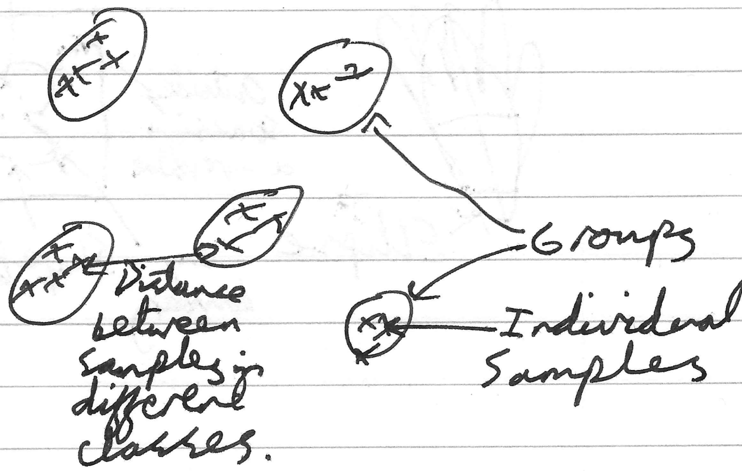
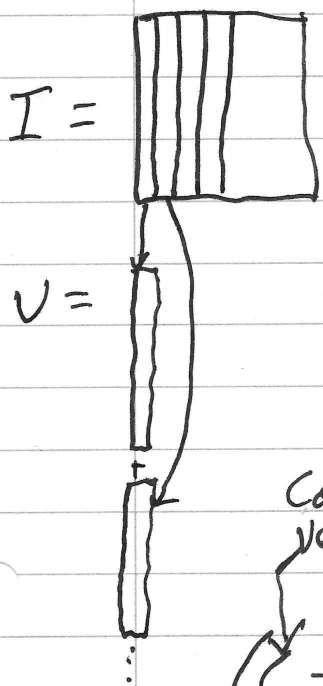
$C = A + jB$

$\theta = \operatorname{Arctg} \dfrac{B}{A}$







The entire dataset:

v_1, v_2, v_3, v_4

$\vec{V}_m = \frac{1}{m} \sum \vec{V}_i$ ← Average Vector

$C_{N \times N} = \frac{1}{m} \sum (V_i - V_m)_{N \times 1} (V_i - V_m)^T_{1 \times N}$

Covariance Vector

Size of matrix

Eigenvalues.

$(C - \lambda I)\vec{x} = 0$ Don't care about $\vec{x} = 0$.

det = 0 → singular Matrix → $|C - \lambda I| = 0$.

Identity Matrix

$\lambda_1, \lambda_2, \lambda_3, \lambda_4, \ldots, \lambda_N$.

$|\vec{x}| = 1$ to compute $\vec{e}_i$ s

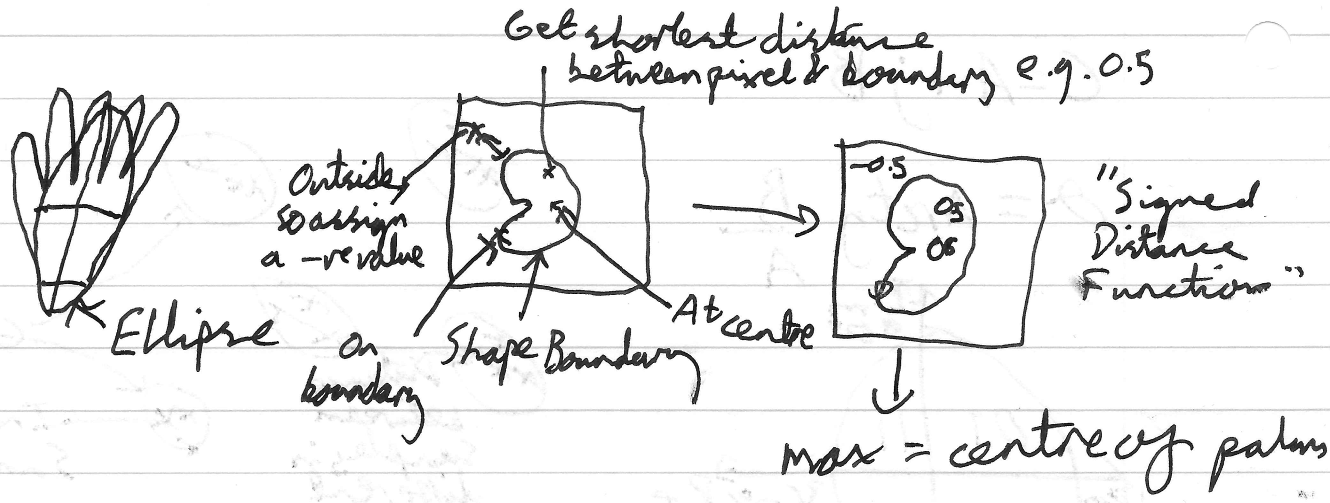
$\vec{e}_1 \longleftrightarrow \lambda_1, \vec{e}_2 \longleftrightarrow \lambda_2, \ldots$ Eigenvectors $\vec{e}$ & Eigenvalues λ.

Can arrange $\vec{e}$ back into an image.

$\vec{V}_i = a_1\vec{e}_1 + a_2\vec{e}_2 + a_3\vec{e}_3 + \cdots + a_n\vec{e}_n$.

$A_1 = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ \vdots \end{bmatrix}$ corresponds to $\vec{v}_1$

Slide 21d.


Get shortest distance between pixel & boundary e.g. 0.5
Outside, so assign a -ve value
On boundary
Shape Boundary
At centre
Ellipse
-0.5
0.5
0.6
"Signed Distance Function"
max = centre of palm