

DISCRIMINANT FUNCTION - LINEAR DISCRIMINANT (CH. 4.1)

(3)

$K=2$ $y(x) = \underline{w}^T x + w_0$ $\geq \phi$ $\begin{matrix} C_1 \\ C_2 \end{matrix}$ BOUNDARY
 $y(x) = \phi$

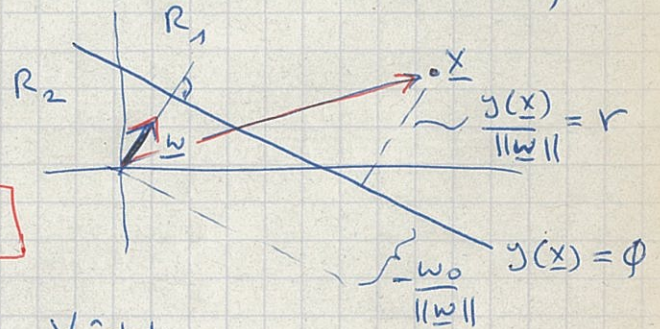
GEOMETRY:

$x_A, x_B \in$ DECISION SURFACE

$$\underline{w}^T (x_A - x_B) = \phi \quad \underline{w} \perp \text{SURFACE}$$

(D-1)-DIM HYPERPLANE

(FIG 4.1)



$K \geq 2$

EVERY CLASS: $y_k(x) = \underline{w}_k^T x + w_{k0}$

$x \in C_k$ IF $y_k(x) > y_j(x) \quad \forall j \neq k$

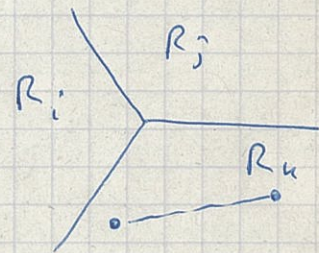
DECISION BOUNDARY BETWEEN C_k C_j :

$$y_k(x) = y_j(x) \quad (D-1)\text{-DIM } \underline{\text{HYPERPLANE}}$$

$$(\underline{w}_k - \underline{w}_j)^T x + (w_{k0} - w_{j0}) = \phi$$

(FIG. 4.3)

DECISION REGION: CONNECTED, CONVEX



LEARNING \underline{w}

- └ LEAST-SQUARES
- └ FISHER'S DISCRIMINANT
- └ PERCEPTION LEARNING