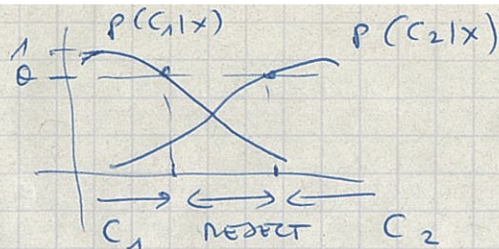


REFLECTION (CH. 1.5.3)



θ $\begin{cases} 1 & \text{ALL} \\ 1/K & \text{NONE} \end{cases}$

(FIG. 1.26)

CLASSIFICATION (CH. 1.5.4)

(a) $p(C_k), p(x|C_k) \xrightarrow{\text{BAYES}} p(C_k|x)$
MODEL $p(x, C_k)$ DIRECTLY

GENERATIVE
APPROACH

(b) $p(C_k|x)$ (NO $p(C_k)$!)

DISCRIMINATIVE
APPROACH

(c) $f(x)$ DISCRIMINANT FUNCTION

$f(x) \rightarrow \begin{cases} 1 \\ 0 \end{cases}$
 \uparrow
 x

COMBINING MODELS WITH CONDITIONAL INDEPENDENCE

X_I X-RAY

X_B BLOOD-TEST

$$p(X_I, X_B | C_k) = p(X_I | C_k) p(X_B | C_k)$$

$$p(C_k | X_I, X_B) \propto \frac{p(C_k | X_I) p(C_k | X_B)}{p(C_k)}$$

CLASSIFICATION WITH LINEAR MODELS (CH. 4)

\Rightarrow DATA LINEARLY SEPARABLE

X_n D-DIMENSIONAL SPACE
(INPUT)

\Rightarrow DECISION BOUNDARIES: (D-1)-DIM HYPERPLANES

MODEL

$y(\underline{x}, \underline{w})$

$$y(\underline{x}) = \underline{w}^T \underline{x} + w_0$$

(LIN-IN-PARAMS
LIN-IN-INPUT)

$$\left(\underline{w}^T \phi(\underline{x}) ! \right) \quad (\text{LIN-IN-PARAMS})$$

$$y(\underline{x}) = f(\underline{w}^T \underline{x} + w_0)$$

AUTIVATION
FUNCTION

GENERALIZED LINEAR MODEL

(NOT LINEAR-IN
PARAMETERS)

└ DECISION BOUNDARIES
LINEAR SURFACES