GNR 602 Advanced Satellite Image Processing :-

attendance { 75-79% - 5 marks ; ≥ 80% - 10 ; <75% - 0 }

No Endsem 🙂

Quizzes (3) → 45%

Midsem → 25%

Programming assign. → 20%

Week 1, Lecture 1 :-

#. Image Classifiers [Scope of the Course]

#. Image segmentation
↳ first step in segregating Images or Clustering Images with common properties.

#. Life-Inspired optimisation methods for Image processing. (analysis).

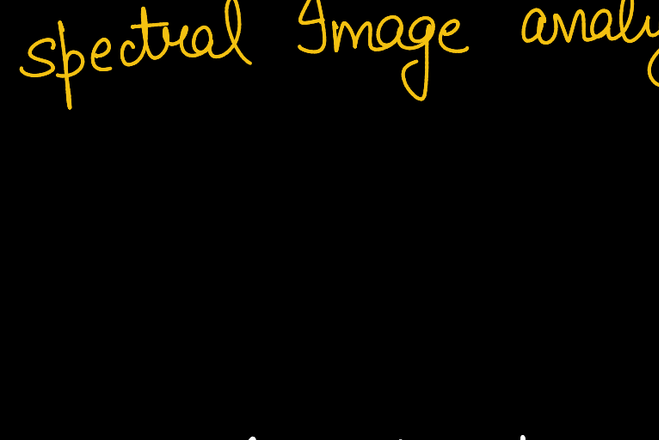
#. Multi-Resolution analysis {Fourier transform knowledge helps}.

#. Hyper-spectral Image analysis

#. CNNs

* 2 Dimensional discrete convulation with Gaussian-filter!
↳ Dekh lenge, chill hai!,

#. Image Classifiers :



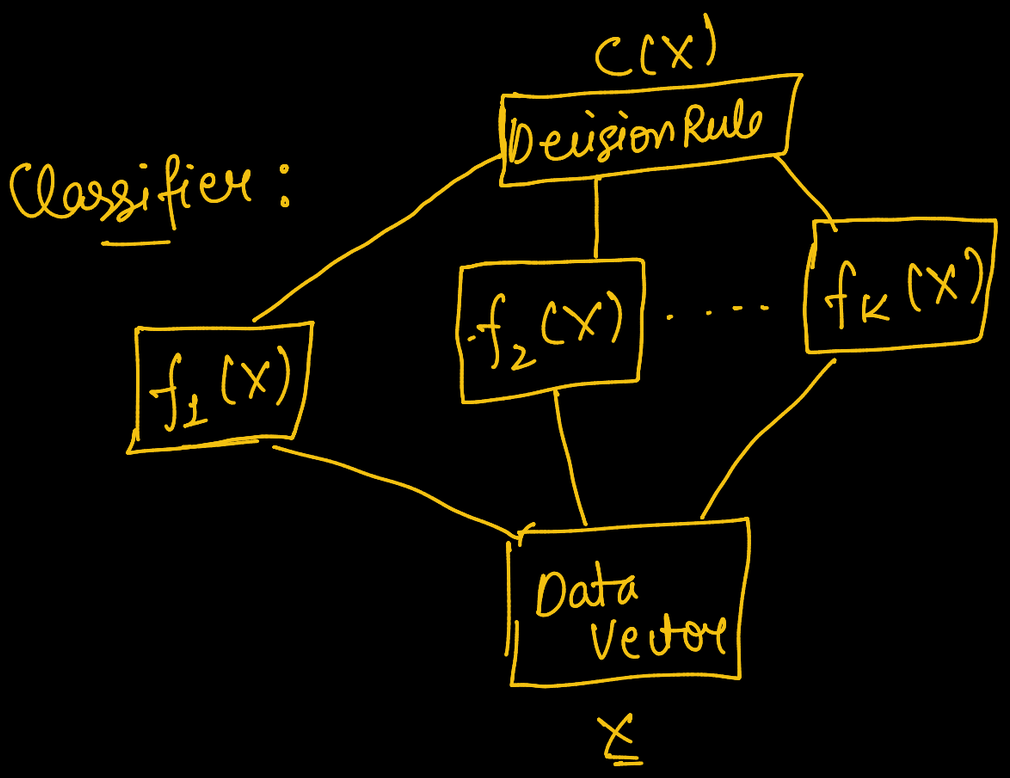
Data Element ↳ [x] => Features

$$x: \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ \vdots \\ x_L \end{bmatrix}$$

Classifying based on features.

#. Classifier, classifies based on ∫

all same data vectors are mapped to same class.



Decision Rule. $\} \quad x \in C_i$

if $f_i(x) \geq f_i(x)$.

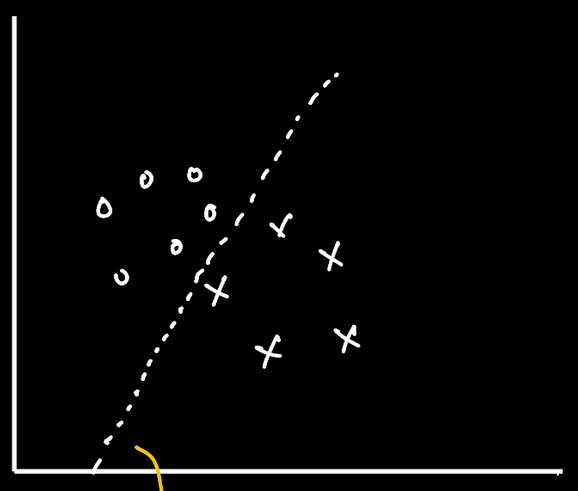
$\{i = 1, 2, \ldots, K\}$

$f_1(x) = P(C|x)$

$f_K(x) = P(C_K|x)$

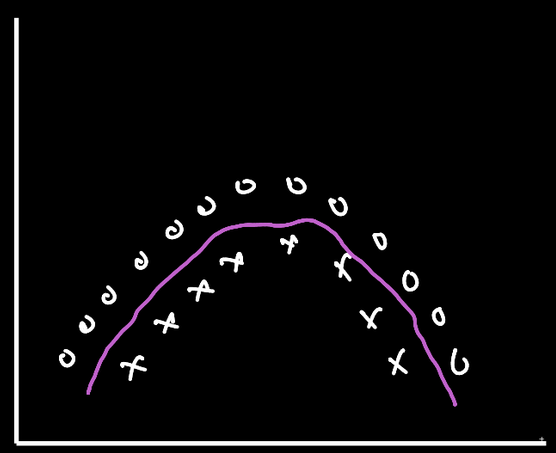
For two class. we can simply classify by a function giving, +ve for one and -ve for other.

#.

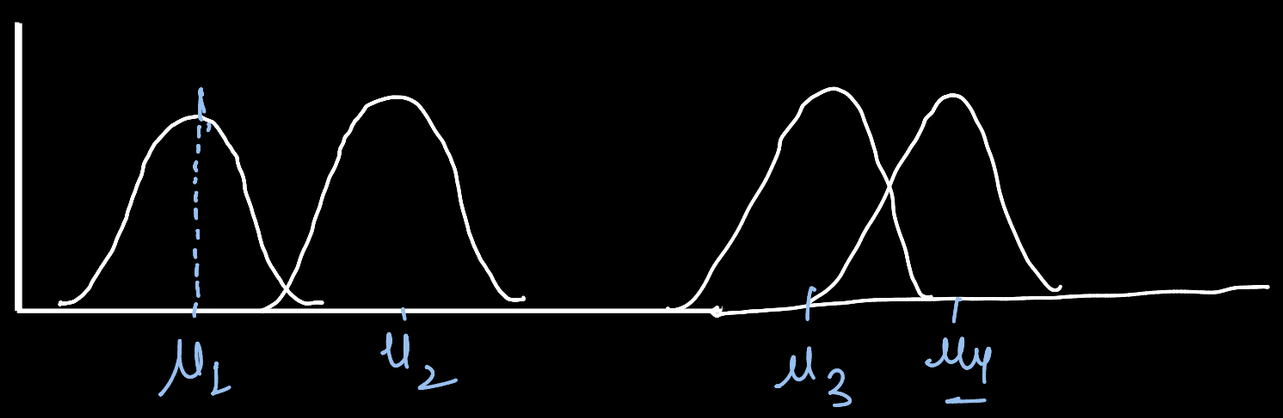


Take it as Example { Job of Classifier is to find Slope & Intercept }
↓
{ with Cond^n of x at one side & o at other }.

Example 2.



Data Cannot be separated using any linear function.
↓
{ linearly non-separable }



★ Probability Estimation

$$P(C_i|x) = \frac{P(x|C_i)\,P(C_i)}{P(x)}$$

Simple Bayes Theorem.

$$f_i(x) = \frac{1}{2}\left\{(x-\mu_i)^T \Sigma^{-1} (x-\mu_i)\right\} - \frac{c}{2}\ln 2\pi - \frac{1}{2}|\Sigma_i| + \ln[P(C_i)].$$