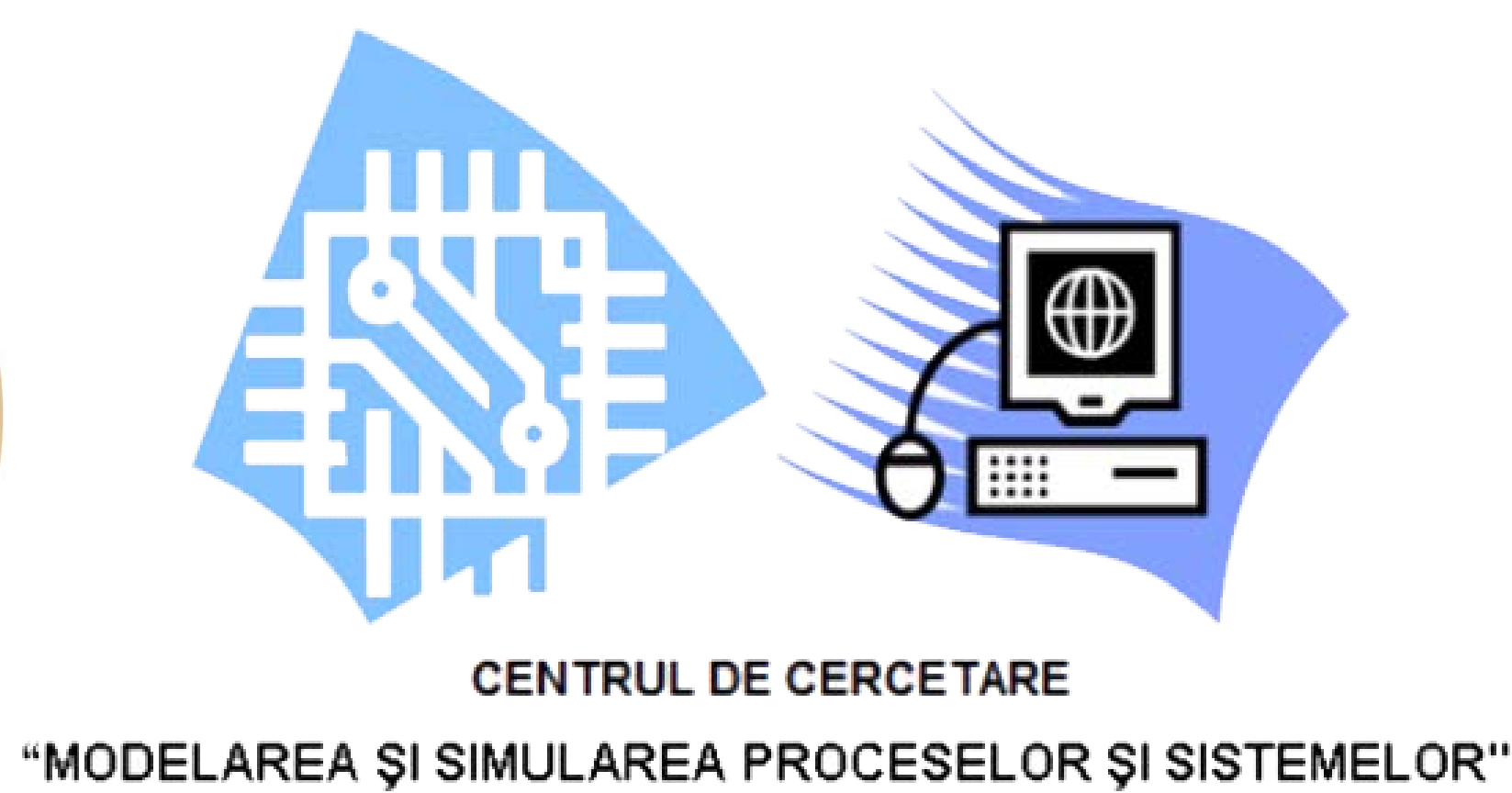




Drăxlmaier

Proiect cu operatorul economic S.C. DPR Draexlmaier Procese de Productie Romania SRL

Contract nr. 4/24.01.2014 (5/21.01.2014)

Valoare: 20744 EUR cu TVA

Perioada de desfasurare a proiectului: februarie 2014 – decembrie 2014

RECOGNITION AND CLASSIFICATION OF SURFACES AND STRUCTURES

Evaluation and creation of specific algorithms in order to be integrated into industrial image processing systems

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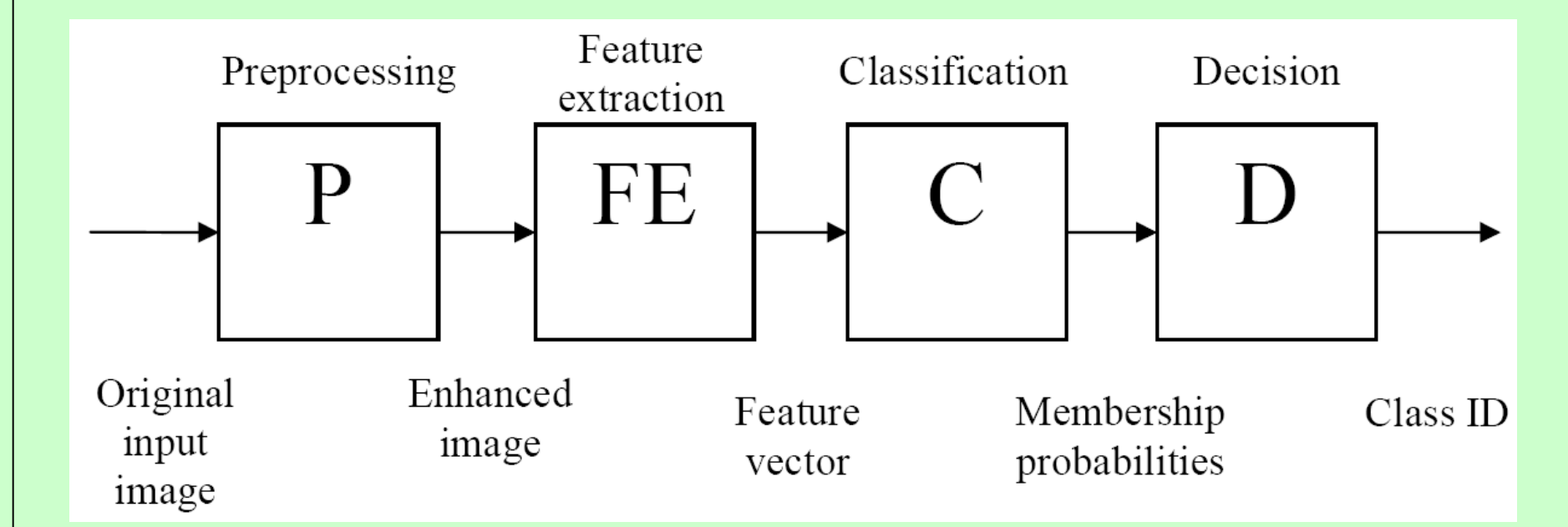
SCURTĂ DESCRIERE

Obiectivul contractului de cercetare a fost de a construi algoritmi software capabili sa analizeze, recunoasca si clasifice suprafete si structuri din imagini in scopul de a fi integrati in sistemele de procesare de imagini industriale ale Draexlmaier pentru automatizarea proceselor de clasificare a materialelor si identificare a potentialelor defecte.

REZULTATE

- Au fost identificati, implementati si evaluati numerosi algoritmi de extragere a caracteristicilor esentiale din imagini.
- Au fost indentificati, analizati, adaptati si evaluati diversi algoritmi de clasificare a imaginilor pe baza caracteristicilor lor esentiale.
- Au fost propusi algoritmi originali pentru reducerea dimensionalitatii imaginilor, pentru clasificare si pentru detectie de defecte.
- In urma evaluarilor efectuate au fost retinuti doi clasificatori si un algoritm de detectie a defectelor, care au fost implementati intr-o aplicatie demonstrativa realizata in C#.

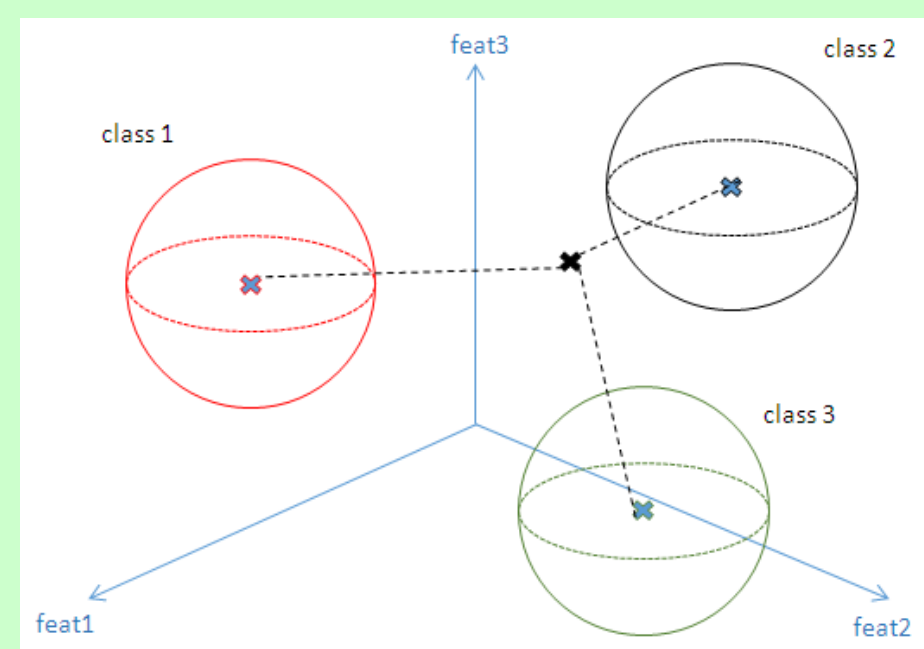
1. Etapele generale ale procesului de clasificare



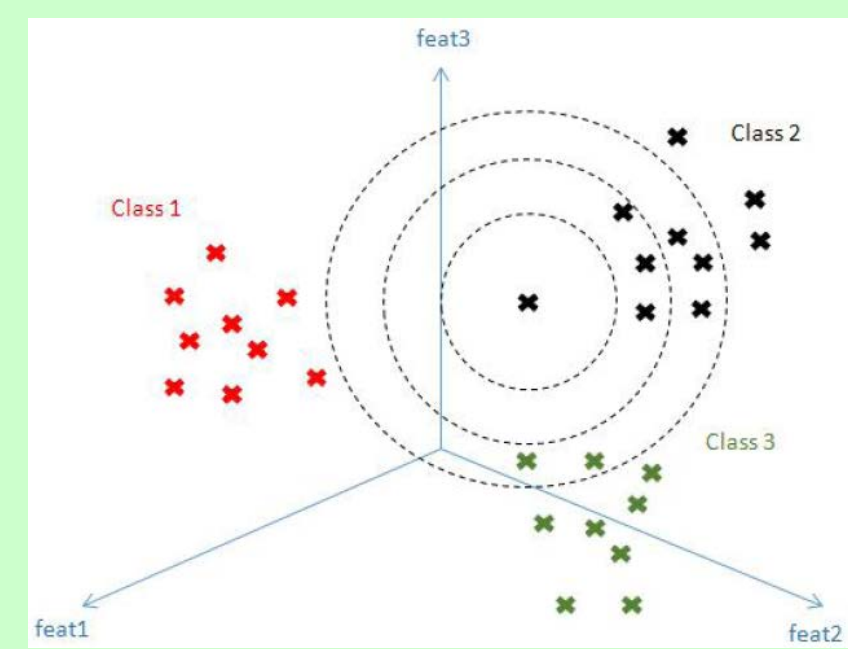
1.1. Rezultatele evaluarii individuale pentru diverse features

Overlap	Feature	Feature name
76.446295	M1 of the Fourier normalized bandwidth (0.2, 0.4)	M10204
85.586054	M1 of the Fourier transform	M1
131.506941	Energy of the Fourier normalized bandwidth (0.3, 0.5)	E0305
139.448235	Energy of the Fourier normalized bandwidth (0.4, 0.6)	E0406
170.193116	M1 of the Fourier normalized bandwidth (0.4, 0.5)	M10405
282.707388	Energy of the Fourier normalized bandwidth (0.25, 0.5)	E02505
296.229269	M4 of the Fourier transform	M4
379.077384	Sigma2	S2
395.810950	Inertia of the Fourier transform	INE
462.622258	Energy of the Fourier normalized bandwidth (0.2, 0.4)	E0204
520.390632	Entropy of the Fourier transform	ENT
1939.834804	Skewness of the histogram	SKW

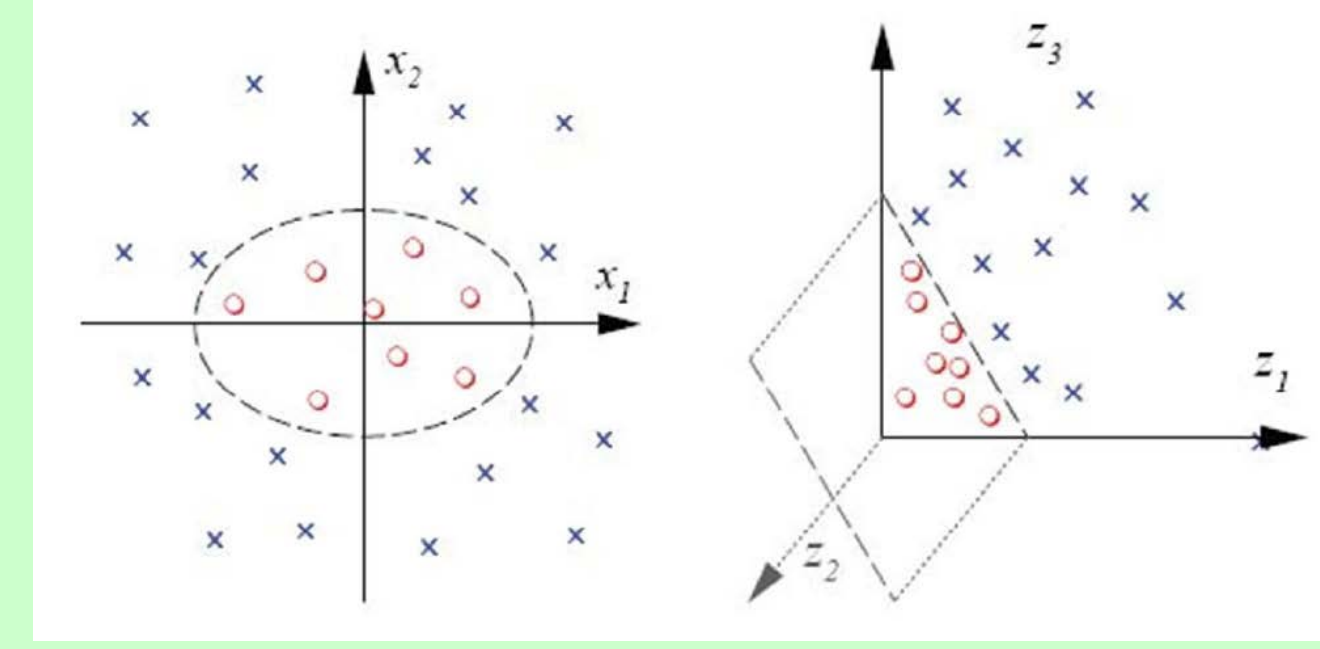
1.2.1. Clasificatorul Min-dist



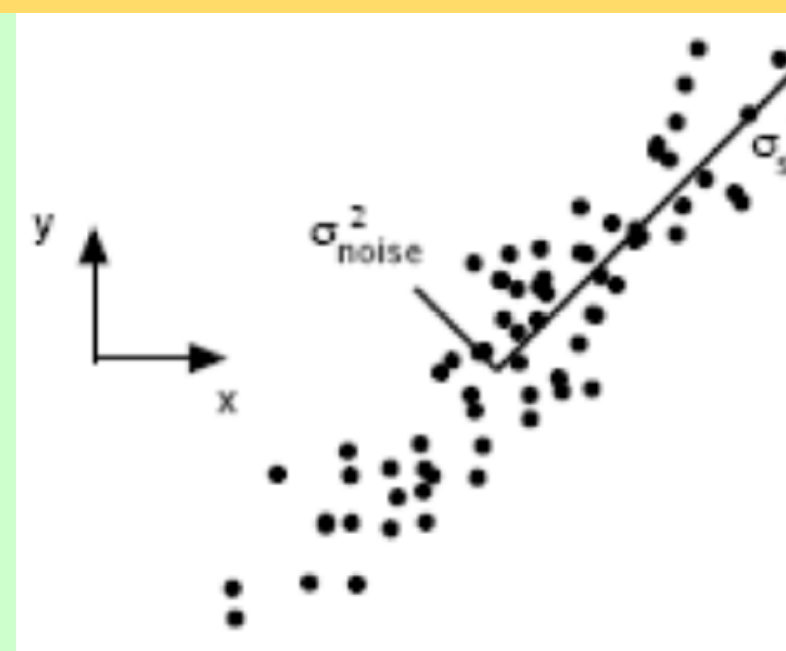
1.2.2. Clasificatorul KNN



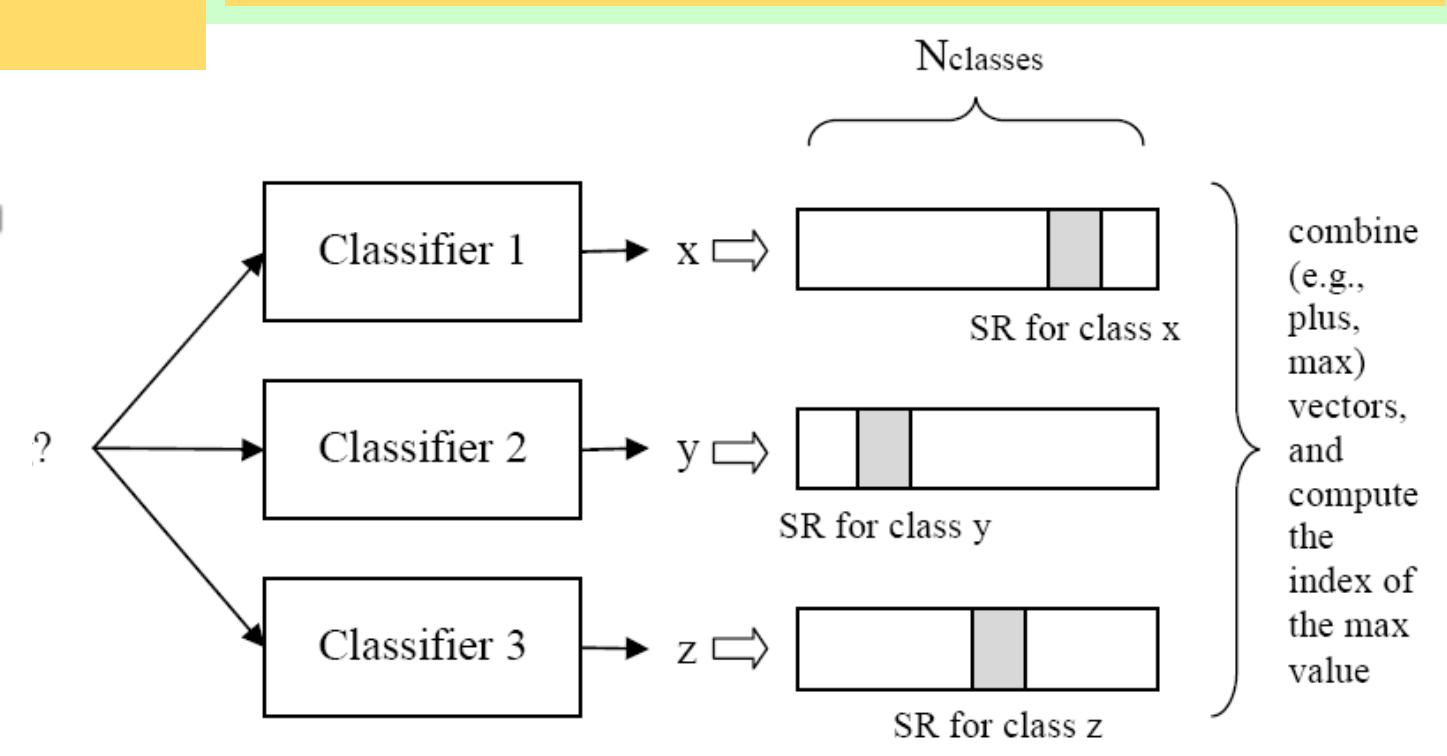
1.2.3. Support Vector Machines



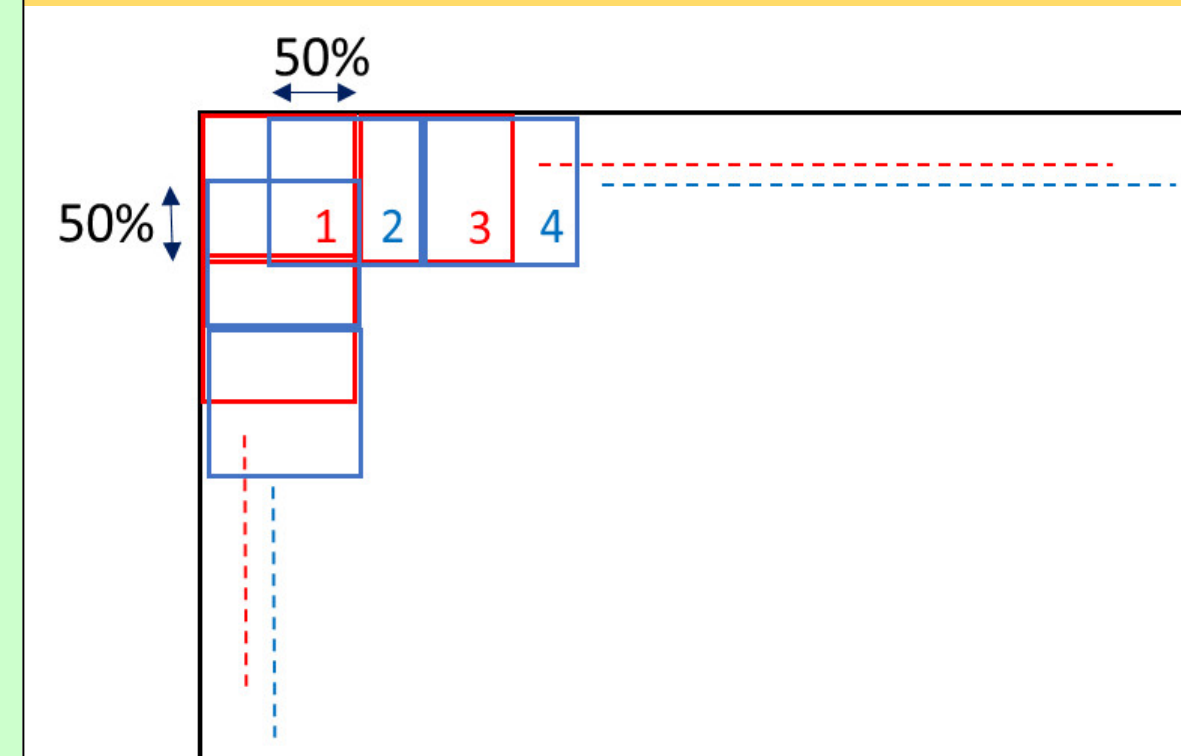
1.2.4. Principal Component Analysis



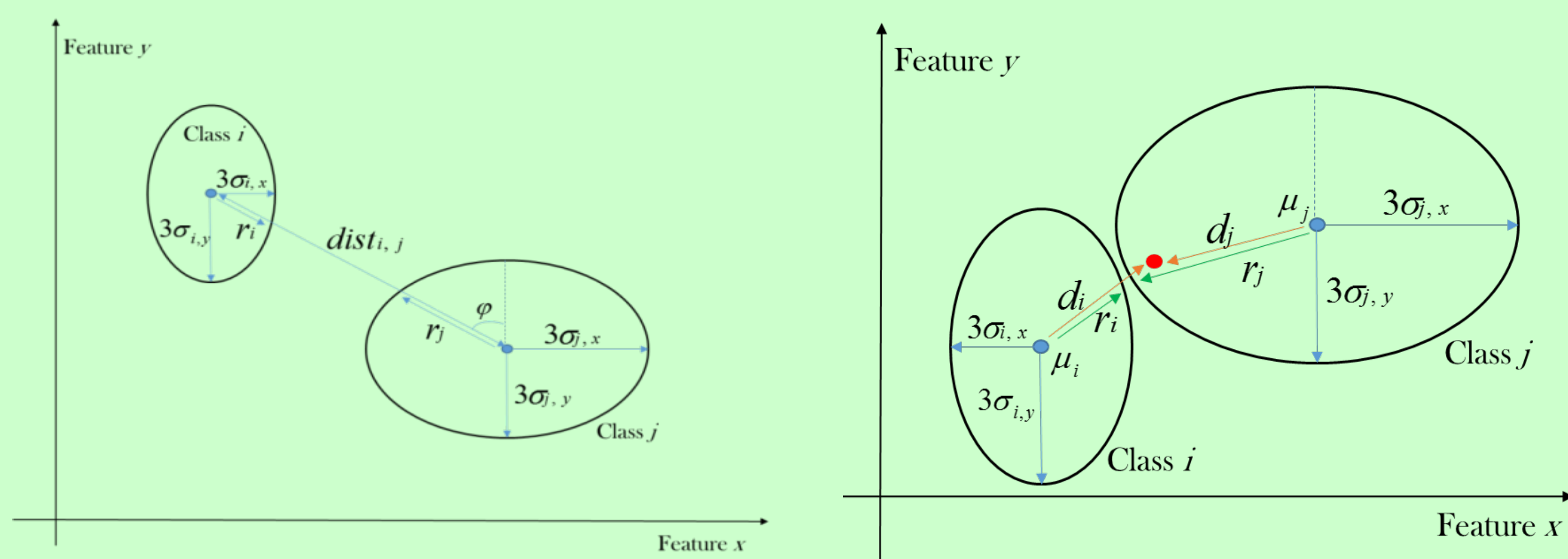
1.2.5. Clasificatorul Ensemble



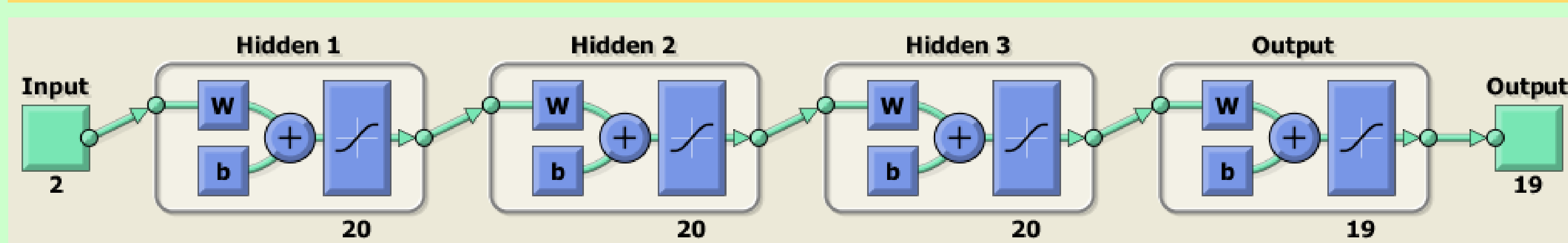
2. Detectia defectelor



1.3.1 Ideea de lucru a algoritmului de clasificare pe baza de elipsoizi



1.3.2 Structura rețelei neuronale utilizate pentru algoritmul de clasificare ANN



3. Interfata aplicatiei software rezultate

