

Assignment 2

Due: Tue, Nov 3, 23h59, by email to `jaime.cardoso@fe.up.pt`

1. Implement in Matlab the Parzen window density estimation using the spherical Gaussian window function

$$\phi((\mathbf{x} - \mathbf{x}_i)/h) \propto \exp[-(\mathbf{x} - \mathbf{x}_i)^t(\mathbf{x} - \mathbf{x}_i)/(2h^2)]$$

Write a program to classify an arbitrary test point \mathbf{x} based in the Parzen window estimates. Train your classifier using the 3-dimensional data from 3 categories in ‘parzenData.txt’. Set $h = 1.5$ and classify the following three points: $(0.5, 1, 0)^t$; $(0.31, 1.51, -0.5)^t$; $(-0.3, 0.44, -0.1)^t$.

2.
 - (a) Implement a perceptron using the perceptron rule to update the weights.
 - (b) Implement a perceptron using the gradient rule to update the weights.
 - (c) Test both functions in the two provided datasets. Analyse the results in terms of convergence behaviour and error.