Assignment 3 Classification problems

Aims:

To develop a system that learns alone nonlinear models by supervising learning.

Task:

Specify, design and deploy an application in python that solve your assigned classification problem.

Points:

- 100 points for full implementation or 50 points if a tool is used.

Time:

Deadline is at the end of the fifth laboratory.

Hints:

Available tools that implements learning methods:

1. Weka http://www.cs.waikato.ac.nz/ml/weka/
2. Matlab http://www.mathworks.com/products/neural-network/
3. OpenCV http://docs.opencv.org/modules/ml/doc/neural_networks.html
4. Scikit - learn http://scikit-learn.org/stable/
5. GPLAB http://gplab.sourceforge.net/
6. ECJ http://cs.gmu.edu/~eclab/projects/ecj/

Problems:

1. Classify a fetal cardiogram as being normal, suspect or pathological based on different measurements performed during the pregnancy. The training data will be taken from:

http://archive.ics.uci.edu/ml/datasets/Cardiotocography

2. Establish if a patient suffers of disk hernia, spondilose or if is healthy based on the informations collected from other patients (regarding the shape and the orientation of the pelvis and the lumbar section of the spine). The training data will be taken from:

http://archive.ics.uci.edu/ml/datasets/Vertebral+Column

3. Establish the moving direction of a robot (forward, slight turn to left, slight turn to right, strong turn to left, strong turn to right) based on the collected data from the sensors. The training data is composed from previous such decisions (informations from 24 sensors from the robot. The sensor position is given by the deviation angle: 180 (front), 165, 150, …, 15, 0 (back), 15, 30, ..., 150, 165). The training data will be taken from:

http://archive.ics.uci.edu/ml/datasets/Wall-Following+Robot+Navigation+Data