SGN-2556 PATTERN RECOGNITION 2011

EXAM 2: 02-05-2011/Jussi Tohka

Non-programmable pocket calculators are allowed

1. Compare the maximum-likelihood and Bayesian parameter estimation based methodologies for the design of the supervised classifiers. Start by giving a brief overview of the two methodologies and clearly state what the basic assumptions are. (The general description suffices, you don't need to go to the details of the Gaussian case). Then, describe the relative advantages and disadvatages of the methodologies.
2. Consider the 2-dimensional exclusive OR problem (that is: the training samples are (1,1), (-1,-1) for the class 1 and (1,-1),(-1,1) for the class 2). These training samples are NOT linearly separable. Provide a generalized linear discriminant function that can be used to separate the training samples, and show that it indeed does separate the training samples.
3. Bagging and boosting in classifier design.
4. Fisher linear discriminant. Outline the idea of discriminant analysis in 2-class case, explain what criterion Fisher linear discriminant maximizes to fullfill this idea, and also discuss the generalization of Fisher linear discriminant for a c-class problem. For the c-class case, you don't need to provide full details, just a description of the basic idea suffices.