

SGN-2556 PATTERN RECOGNITION 2011

EXAM 1: 02-03-2011/Jussi Tohka

Calculators are not allowed in the exam.

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 disadvantages of the methodologies.
2. Generalized linear discriminant functions and margins. Explain what generalized linear discriminant functions are and how to train a classifier based on these. What are margins, how are they used, and what purpose do they serve with classifiers based on generalized linear discriminant functions?
3. Validation, cross-validation, and jackknife for comparing classifiers.
4. Principal component analysis. Explain the basic principle of principal component analysis (What does it do? How it can be performed?). Give an example of how to use principal component analysis in a supervised pattern recognition system.