INF 4300 2015

Classification 1

Exercises related to the lecture on 14.10.15

To give you a chance to catch up after mandatory exercise 1, this week's exercise set is quite small. Next week there will be a larger set of exercises. You will need to implement your ownGaussian classifier for mandatory exercise 2

Exercise 1.

Matlab exercise for classification based on a univariate Gaussian classifier.

Step 1: Implement a Gaussian classifier using a single feature at a time.

For the algorithm, see last lecture foils for lecture 14.10.15

The image tm1.png to tm6.png contain the 6 original bands of a Landsat satellite image of Kjeller (corresponding to different wavlengths).

For images = tm1.png, tm2.png,… tm6.png do

Step 2: Train the classifier

Train the classifier on the image tm$.png (replace with the band number $) (band (found at ~inf3300/www_docs/bilder) using the 4 classesdefined in the mask file tm_train.png. You do this by computing the mean vector and variance for each class k for based on the pixels with class label k in the training mask file.

Classify all pixels in the image and save the estimated class labels in an image. Display this image.

Compute the classification error by counting the number of misclassified pixels in the test mask

tm_test.png (contains the true labels for the test pixels).

(We have one satellite image, and only the pixels in the training mask are used to estimate the parameters mu and sigma. Only the pixels in the test mask are used to compute the classification accuracy. We can still display the entire classified image to look at the result).

Step 3: Find the best feature for classification using single features.

Compute the percentage of correctly classified pixels for each of the features alone, and find the

accuracy for the best single feature.