Department of Computer Science

Assessed Coursework Assignment Brief

Module code: CS3VI18/CSMVI16
Lecturer responsible: Dr. Hong Wei
Coursework description: SPR/ML – land-cover classification lab practicals
Work to be submitted on-line via Blackboard by noon on: 18th February 2019
Work will be marked and feedback returned on the basis of 15 working days after the submission deadline.

MARKING CRITERIA

The lab practical is assessed with 5 marks. A short report with a brief description of the process, classification/evaluation results, brief analysis to the results, conclusion, and the source code, is required for submission. The detailed mark allocation is shown below.

Four objectives, each takes 1 or 2 marks.

- To select training samples from given source data based on information in the given ground truth (at least 20 samples for each class); 1 mark
- To establish Gaussian models for each class with the training samples; 1 mark
- To apply maximum likelihood to the testing data (measured data) and classify each pixel into a class; 2 marks
- To evaluate the classification accuracy by using a confusion matrix and visual aid (colour coded figures). 1 mark

ASSIGNMENT DETAILS

Remotely sensed data are provided in 6 images with the ground-truth information. You are required to implement the Maximum Likelihood (ML) algorithm to classify the given data into four classes, 1 – building; 2 – vegetation; 3 – car; 4 – ground. Comparing with the given ground-truth, you can evaluate the classification accuracy by using a confusion matrix. You may program in MatLab (or other programming languages) to implement the four objectives above.

Given data: 6 bands with size of 211*356 (211 rows and 356 columns) as measured image data; and ground truth (211*356) as text data.

- LIDAR first echo FE, last echo LE (fe, le)
- Image bands of red, green, and blue (r, g, and b)
- Near infrared (nir)
- Ground truth (the numbers of 1, 2, 3, and 4 indicate the four classes)

The given data can be found on the blackboard site with file names in the following table.

Given data	LIDAR FE	LIDAR LE	Red	Green	blue	Near infrared	Ground truth
File name	fe.bmp	le.bmp	r.bmp	g.bmp	b.bmp	nir.bmp	ground_truth.mat