



Hyperspectral Data Analysis Using Feature Extraction Techniques

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Objectives

- Carrying out a maximum likelihood supervised classification using feature extraction techniques, including DAFE, DBFE and NWFE;
- Exploring and comparing the use of the three feature extraction techniques.

Data set and Method

- Washington DC mall with 210 spectral bands (0.4-2.4 μm), 15M
- Use DAFE, DBFE and NWFE techniques to obtain 15 optimal features
- Reformat data set using the first 15 features from DAFE, DBFE and NWFE, respectively
- Classify reformatted data set using the maximum likelihood classifier



Result

Table 1 - Classification Accuracy

• Field Type	• Classification Accuracy		
	• DAFE	• DBFE	• NWFE
• CPU time* (min.)	• 0.3	• 28	• 18
• Training Fields	• 100%	• 100%	• 99.9%
• Test Fields	• 99.7%	• 99.4%	• 99.4%

* A DELL PC G*240 was used.



Conclusion

- Efficient techniques;
- Similar performance in this particular dataset;
- Multispec is recommendable.
(Available <http://dynamo.ecn.purdue.edu/~biehl/MultiSpec/>)
- “Signal Theory Methods in Multispectral Remote Sensing” by Prof. Landgrebe