

Classify Students' Testing Performances Using Pattern Recognition Techniques

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Abstract

After a teaching process, a test is usually administered to diagnose the students' learning status and remedial instruction is planned according to test results. The investigation results show that student's total score on a test is not the most useful information for teachers to prepare the remedial instruction. The purpose of this study is to develop a classification process to classify students into several groups which are easy to implement some remedial instruction.

Usually, there are 20-30 items in a test, and the dimensionality of test data is high. Unfortunately, the number of training samples required to train a classifier for high dimensional data is much greater than that required for low dimensional data, and gathering these training samples are difficult and expensive. Feature extraction is usually applied to overcome this difficulty. The performances of several statistical (Fukunaga, 1990) and neural network (Haykin, 2000) classifiers using features extracted based on Rule Space (Tatsuoka, 1984), LDA, aPAC-LDR, NDA, and NWFE (Kuo & Landgrebe, 2002a, 2002b) methods are compared in this study. Finally, an appropriate classification procedure for test data is proposed.

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