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APPLICATION OF THE SCHEFFE' METHOD OF MULTIPLE  
COMPARISON TO DETERMINATION OF CLASS SEPARABILITY

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Consistent measures of class separability are of utmost importance in multiclass, multifeature discriminant analysis. Divergence procedures, based on the likelihood ratios and conditional probability distributions under Gaussian assumptions, have constituted the common approach to the class separability problem. A significant limitation, however, presently exists in divergence statistics. This limitation results from the fact that the same divergence value will represent different degrees of separability among the possible class pairs considered. In order to develop a statistic that will provide a consistent measure of separability for any possible pair of classes, the Scheffe' (1959) method of multiple comparisons has been adapted to the date and feature selection task.

Significance of difference probabilities ( $\alpha$ ) are calculated for all class pairs and displayed in matrix form. Those class pairs with  $\alpha$ 's below user specified thresholds are termed separable for classification purposes. Class separability may be determined in this fashion inexpensively for large combinations of channels or sets of channels grouped by date.

The best channel or date sets are defined as those giving the lowest sum of  $\alpha$  over all class pairs considered. The  $\alpha$  values for given class pairs may be differentially weighted to emphasize the economic and/or biological importance in separating those particular class pairs.

LITERATURE CITED

Scheffe, H. 1959. The Analysis of Variance. John Wiley & Sons, Inc., New York. 477p.