



STATISTICS DEPARTMENT

SEMINAR

TITLE: **SPARSE LINEAR DISCRIMINANT ANALYSIS**

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TIME: 4:00 P.M.

DATE: Wednesday, January 25, 2006

ROOM: 140 BARDEEN

ABSTRACT:

Fisher's linear discriminant analysis (LDA) is typically used as a feature extraction or dimension reduction step before classification. We further this dimension reduction technique by incorporating variable selection into LDA. Methods are proposed to find sparse projection directions, where "sparse" means that the directions involve only a small number of significant variables. Utilizing the connection of Fisher's LDA and a generalized eigenvalue problem, our approach applies the method of regularization to obtain sparse generalized eigenvectors. When the sample size is smaller than the dimension of the input data, the standard Fisher's LDA is not directly applicable. To deal with these cases, we formalize two generalizations of Fisher's LDA and for these generalizations we develop methods to find the sparse projection directions. Simulation and real data examples show that our methods can not only identify the important variables, but also improve the discriminant performance in the presence of redundant variables.

Coffee and Cookies at 3:30 p.m. in Room 1210 MSC