Sufficient dimension reduction methods are designed to help reduce the dimensionality of data sets without loss of regression information for a better visualization, prediction, and modeling. We develop their first use for dependent multi-dimensional features with respect to an outcome of interest in the presence of other covariates. Existing likelihood-based sufficient dimension reduction methods assume the existence of independent and identically distributed sample. However, observations are often recorded on subjects or clusters. While the observations from cluster to cluster could be independent, the within-cluster observations are likely dependent. Treating the within-cluster observations as independent may adversely affect the estimation of the central subspace. The parameters in the proposed models reside in Grassmann manifold, and also in the manifolds of symmetric positive definite matrices. We propose a maximum likelihood estimation of these parameters in their natural parameter-spaces when the observations are dependent within clusters.

Refreshments will be served at 3:30 p.m.