
Principle Component Analysis, or PCA for short, is a common statistical procedure for reducing the dimensionality of a given data set. In a nutshell, PCA allows one to represent a data set as a linear combination of uncorrelated random variables via a change of basis. Moreover, this transformation is optimal in the least squares sense. In the first part of this talk, we will briefly go over the basics of PCA through examples. Then we will introduce an alternative Bayesian inference approach to PCA in which the basis vectors themselves are random. This will allow us to quantify the uncertainty in the principle components when we have limited samples of the data. In order to perform the Bayesian inference, an efficient Gibbs sampler over the space of orthonormal matrices is utilized. (Received February 02, 2015)