



RUTGERS-CAMDEN MATH SEMINAR

11-12, FRIDAY FEB-18TH, BSB 132

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Title: Analysis of two-component Gibbs samplers using the theory of two projections

Abstract: Gibbs samplers are a class of Markov chain Monte Carlo (MCMC) algorithms commonly used in statistics for sampling from intractable probability distributions. In this talk, I will demonstrate how Halmos's (1969) theory of two projections can be applied to study Gibbs samplers with two components. I will first give an introduction to MCMC algorithms, particularly Gibbs algorithms. Then, I will explain how problems regarding the asymptotic variance and convergence rate of a two-component Gibbs sampler can be translated into simple linear algebraic problems through Halmos's theory. In particular, a comparison is made between the deterministic-scan and random-scan versions of two-component Gibbs. It is found that in terms of asymptotic variance, the random-scan version is more robust than the deterministic-scan version, provided that the selection probability is appropriately chosen. On the other hand, the deterministic-scan version has a faster convergence rate. These results suggest that one may use the deterministic-scan version in the burn-in stage, and switch to the random-scan version in the estimation stage.

