

The University of Chicago

Department of Statistics

Seminar

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“The Randomness Recycler: A New Technique for Perfect Sampling”

Monday, April 1, 2002 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

For many probability distributions of interest, it is quite difficult to obtain samples efficiently. Often, Markov chains are employed to obtain approximately random samples from these distributions. The primary drawback to traditional Markov chain methods is that the mixing time of the chain is usually unknown, which makes it impossible to determine how close the output samples are to having the target distribution. Here we present a new protocol, the randomness recycler (RR), that overcomes this difficulty. Unlike classical Markov chain approaches, an RR-based algorithm creates samples drawn exactly from the desired distribution. Other perfect sampling methods such as coupling from the past use existing Markov chains, but RR does not use the traditional Markov chain at all. While by no means universally useful, RR does apply to a wide variety of problems. For several problem instances, it gives the first expected linear time interruptible algorithms for generating observations. I will discuss how RR applies to self-organizing lists, the Ising model, random independent sets, random colorings, the random cluster model, and other problems.

(This talk will be based on joint work with Mark Huber of Duke University.)