

Title:

**SEQUENTIAL MONTE CARLO METHODS FOR STATISTICAL  
ANALYSIS OF TABLES**

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Technical Report number (Dept. of Statistics, Stanford Univ.):

**2003-24**

Date:

**August 2003**

Abstract:

This paper describes a sequential importance sampling (SIS) procedure for simulating two-way zero-one or contingency tables with fixed marginal sums. An essential feature of the new method is that it samples the columns of the table progressively according to certain special distributions. For the zero-one tables, the new method produces Monte Carlo samples that are remarkably close to the uniform distribution, enabling one to obtain an accurate estimate of the total number of zero-one tables with fixed margins and to approximate closely the null distributions of a number of test statistics involved in testing hypotheses about such tables. Our method compares favorably with other existing Monte Carlo-based algorithms, sometimes our approach can be a few orders of magnitude more efficient than others.