



The University of Chicago
Department of Statistics

Mini-seminars for Second Year Ph.D. Students

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How Often to Shuffle a Deck of Cards?

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110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

The mixing time for riffle shuffling a deck of n cards in the Gilbert-Shannon-Reeds (GSR) model is $3/2 \cdot \log_2(n)$. Roughly seven shuffles are necessary and suffice to mix a deck of 52 cards in this model. We study a Markovian extension of the GSR model to a one parameter family of shuffles mentioned in Aldous (1983). The only result about the mixing time of this model that I found in the literature is a lower bound of order $\log(n)$. We show how to derive this bound via the entropy method. Furthermore, we show that a certain natural imitation of the analysis of the GSR model in Bayer & Diaconis (1992) does not work in this one parameter family of shuffles.