
FRANCO SALIOLA, Université du Québec à Montréal

Spectrum of the random-to-random operator

Pick a card, any card, from the deck and remove it; then put it back anywhere in the deck. Repeating this process leads to a method of shuffling a deck of cards known as the random-to-random shuffle. Its efficiency is controlled by the spectrum of its transition matrix, which turns out to be closely related to the combinatorics of the symmetric group.

In this talk we will give a combinatorial description of this spectrum and outline some of the ideas that go into the proof. This settles a conjecture made in 2002 by Uyemura-Reyes: after a suitable renormalization, this spectrum is integral. Our analysis makes considerable use of the representation theory of the symmetric group. This is joint work with Ton Dieker.