

Limit Profiles of Reversible Markov Chains

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ABSTRACT

It all began with card shuffling. Diaconis and Shahshahani studied the random transpositions shuffle; pick two cards uniformly at random and swap them. They introduced a Fourier analysis technique to prove that it takes $0.5 \cdot n \cdot \log n$ steps to shuffle a deck of n cards this way. Recently, Teyssier extended this technique to study the exact shape of the total variation distance of the transition matrix at the cutoff time from the stationary measure, giving rise to the notion of a limit profile. In this talk, I am planning to discuss a joint work with Olesker-Taylor, where we extend the above technique from conjugacy invariant random walks to general, reversible Markov chains. I will also present a new technique that allows us to study the limit profile of star transpositions, which turns out to have the same limit profile as random transpositions, and I will discuss open questions and conjectures.