

Perfect sampling algorithm for Schur processes

Mirjana Vuletic, University of Massachusetts

We describe random generation algorithms for a large class of random combinatorial objects called Schur processes, which are sequences of random (integer) partitions subject to certain interlacing conditions. This class contains several fundamental combinatorial objects as special cases, such as plane partitions, tilings of Aztec diamonds, pyramid partitions and more generally steep domino tilings of the plane. Our algorithm, which is of polynomial complexity, is both exact (i.e. the output follows exactly the target probability law, which is either Boltzmann or uniform in our case), and entropy optimal (i.e. it reads a minimal number of random bits as an input). The algorithm encompasses previous growth procedures for special Schur processes related to the primal and dual RSK algorithm, as well as the famous domino shuffling algorithm for domino tilings of the Aztec diamond.

This is a joint work with D. Betea, C. Boutillier, J. Bouttier, G. Chapuy and S. Corteel.