

1135-05-714

Megan Bernstein, Matthew Fahrbach* (matthew.fahrbach@gatech.edu) and **Dana Randall**. *Analyzing Boltzmann samplers for Bose–Einstein condensates with Dirichlet generating functions.*

Boltzmann sampling is commonly used to uniformly sample objects of a particular size from large combinatorial sets. For this technique to be effective, one needs to prove that (1) the sampling procedure is efficient and (2) objects of the desired size are generated with sufficiently high probability. We use this approach to give a provably efficient sampling algorithm for a class of weighted integer partitions related to Bose–Einstein condensation from statistical physics. Our sampling algorithm is a probabilistic interpretation of the ordinary generating function for these objects, derived from the symbolic method of analytic combinatorics. Using the Khintchine–Meinardus probabilistic method to bound the rejection rate of our Boltzmann sampler through singularity analysis of Dirichlet generating functions, we offer an alternative way to analyze Boltzmann samplers for objects with multiplicative structure. (Received September 13, 2017)