

Ordered Chinese Restaurant Process up-down chains

Up-Down chains on branching graphs provide an interesting link between the algebraic structure of branching graphs and stochastic processes on the boundaries of these graphs. Up-down chains on branching graphs whose vertices are given by partitions of an integer are well understood, but up-down chains on branching graphs whose vertices are compositions of an integer have only begun to be studied recently. In this talk we will discuss up-down chains on graphs of compositions whose up-steps are based on the Ordered Chinese Restaurant Process. We will show how these can be used to construct diffusions on the boundary of this graph whose generators have simple expressions in terms of quasi-symmetric functions. We will give examples showing what sorts of new statistics can be understood based on the order structure, with an emphasis on a connection to phylogenetics where the order structure can be interpreted as the relative ages of alleles in a population.