

Probabilistic generalizations of the Robinson–Schensted correspondence

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Abstract

The Robinson–Schensted (RS) correspondence is a bijection between permutations and pairs of standard Young tableaux. It plays a role in a number of different contexts, such as the combinatorial study of Schur polynomials, the representation theory of S_n and GL_n , the geometry of Springer fibers in the flag variety, and the distribution of the longest increasing subsequence in a random permutation.

In the past decade, several randomized generalizations of RS have been introduced, in which each permutation has nonzero probability of mapping to several different pairs of tableaux. These variants depend on a parameter q or t , and they are related to q -Whittaker or Hall–Littlewood polynomials, which are one-parameter deformations of Schur polynomials.

In this talk, I will describe a (q, t) -dependent, probabilistic generalization of RS which is related to Macdonald polynomials, a two-parameter deformation of the Schur polynomials. Our generalization unifies all the versions mentioned above, including both the row insertion and column insertion variants of the original RS correspondence. I will not assume prior knowledge of Schur polynomials or RS.

This is based on joint work with Florian Aigner.

Keywords: standard Young tableaux, Schur polynomial, flag variety, Hall–Littlewood polynomial, Macdonald polynomial.