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A combinatorial result with applications to random walks.

ABSTRACT: Excited random walks (or random walks in cookie environments) are random walk models in which the probability of departing to the right from a site depends on the number of visits to that site (equivalently how many cookies have been eaten at that site) up to the present time. Work of Zerner, Basdevant and Singh, and others, has demonstrated various different types of behaviour possible with a bounded number of biased cookies at each site.

We'll discuss a deterministic combinatorial result that compares two integer sequences $l(n)$ and $r(n)$ defined in terms of collections L and R of arrows satisfying a natural monotonicity relation. Applying this when the arrows are random, the sequences produce non-monotone couplings of self-interacting random walks (such as excited random walks in one dimension). This allows us to extend known results about such models. [Joint work with Tom Salisbury]