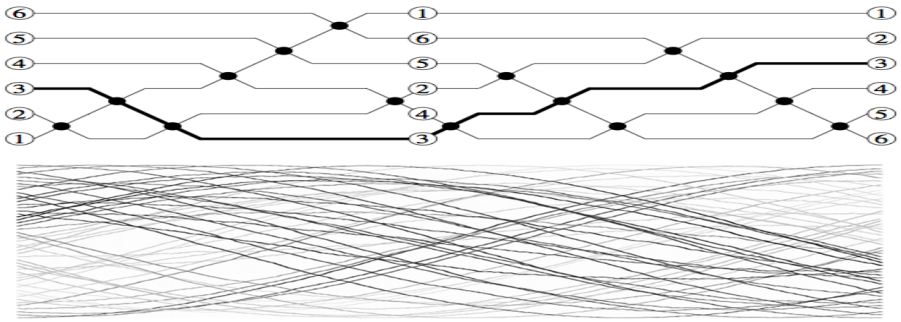
The SUMO Speaker Series for Undergraduates

Thursday April 9
4:15-5:05, Room 380C

(Food Provided)

Random sorting networks

Eric Marberg



Abstract

Consider n items arranged in a column. By successively swapping pairs of adjacent items, one can eventually reverse the order of the original arrangement. A sorting network is a choice of such swaps which achieves this reversal in as few steps as possible: this is conveniently visualized as a "wiring diagram" consisting of n wires marking the trajectories of our items as we perform each swap. Alternatively, sorting network may be identified with reduced words of the longest element in the symmetric group S_n. This talk will be about work of Angel, Holroyd, Romik, and Virág on some amazing properties of random sorting networks, that is, sorting network chosen at random from the uniform distribution. For example, it is conjectured that the trajectories of the items in a random sorting network (when properly scaled) converge almost always to random sine curves as n tends to infinity. Moreover, the permutation matrix representing the relative item positions at the halfway point in a random sorting network seems almost always to be circularly symmetric. The talk will survey what is known about these conjectures, and the intuition behind them.

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