

The two-sided loop-erased random walk

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A loop-erased random walk (LERW) is obtained from a simple random walk by erasing the loops chronologically. LERW also appear as paths in uniform spanning trees. I construct the two-sided LERW for all dimensions. This can be considered as the distribution of a LERW as seen “from the middle” or can be considered as the path going through the origin of a uniform spanning tree “conditioned that the path has two sides.”

For the case $d = 2$, the transition probabilities are related to the potential theory for random walks with some negative weights (zipper). I will discuss some recent work with Christian Benes and Fredrik Viklund on this.

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