# The distribution of the effective resistance

The effective resistance between two vertices of a graph is a very useful parameter that is closely related to spanning tree enumeration and random walks on graphs −for example, the commute time of the simple random walk is directly proportional to the effective resistance.

The effective resistance can be calculated quite easily for series−parallel graphs: it is additive with respect to the "series" construction, and its reciprocal, the effective conductance, is additive with respect to the "parallel" construction.

Series−parallel graphs would therefore seem to be ideal candidates for studying the distribution of the effective resistance. They can also be nicely enumerated by means of generating functions. The main problem seems to be the fact that the reciprocals that occur might not fit the generating function scheme very well.