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We propose a notion for a robust geodesic distance between data points: the minimum number of steps needed to reach one data point from another in an irreducible finite Markov chain, at a specified probability level. We calculate these distances via simple matrix multiplication, and are currently looking at ways to reduce the computation time.

In related work, we have noticed that it is quite easy to compute the traditional geodesic distance between data points, to within universal constant multiples of the true value. The method we describe discards most of the information present in the Markov matrix by replacing the actual numerical values with 1's for "yes" and 0's for "no" (in determining membership in a local neighborhood). The resulting computations are very efficient since they can be carried out in binary arithmetic. (Received September 20, 2007)