A Simple Method for Computing Resistance Distance

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The resistance distance r_{ij} between two vertices v_i and v_j of a (connected, molecular) graph G is equal to the effective resistance between the respective two points of an electrical network, constructed so as to correspond to G, such that the resistance of any edge is unity. We show how r_{ij} can be computed from the Laplacian matrix L of the graph G: Let $L(i)$ and $L(i, j)$ be obtained from L by deleting its i-th row and column, and by deleting its i-th and j-th rows and columns, respectively. Then $r_{ij} = \det L(i, j)/\det L(i)$.

Key words: Resistance Distance; Laplacian Matrix; Kirchhoff Index; Molecular Graph.