

Quantum Mechanics Accelerates PageRank

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One important application that lets us cope with information overload on the web is the PageRank algorithm.

Computation of this quantity is usually made iteratively with a large use of computational time. Nicola Perra and colleagues now show that PageRank can be expressed in terms of a wave function obeying a Schroedinger-like equation.

The disorder given by the unbalance of outgoing and ingoing links between different web pages, induces a wave function and potential structuring.

This allows them to directly localize the pages with the largest score. Through this new representation they say they can now compute PageRank without iterative techniques.

The method is much faster than standard pagerank algorithms. "Our results also clarify the role of topology in the diffusion of information within complex networks," the researchers say, "The whole approach opens the possibility to novel techniques inspired by quantum physics for the analysis of the WWW properties."

SOURCE: <http://arxiv.org/abs/0807.4325>

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