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Schroedinger-like PageRank wave equation could revolutionise web rankings

[quantum-pagerank.jpg](#)

The PageRank algorithm that first set Google on a path to glory measures the importance of a page in the world wide web. It's fair to say that an entire field of study has grown up around the analysis of its behaviour.

That field looks set for a shake up following the publication today of an entirely new formulation of the problem of ranking web pages. Nicola Perra at the University of Cagliari in Italy and colleagues have discovered that when they re-arrange the terms in the PageRank equation the result is a Schroedinger-like wave equation.

So what, I hear you say, that's just a gimmick. Perhaps, but the significance is that it immediately allows the entire mathematical machinery of quantum mechanics to be brought to bear on the problem—that's 80 years of toil and sweat.

Perra and pals point out some of the obvious advantages and disadvantages of the new formulation.

First, every webpage has a quantum-like potential. The topology of this potential gives the spatial distribution of PageRank throughout the web. What's more, this distribution can be calculated in a straightforward way which does not require iteration as the conventional PageRank algorithm does.

