



# Getting Results on the Web

Imagine trying to find the right information quickly in a library where billions of pages are randomly piled in a heap, instead of being in books shelved in order. That's what Web search engines do, millions of times a day. First-generation search engines often found useful pages, but those pages may have been too far down the list to be of any practical use. Current search engines rank pages by using mathematics—probability, graph theory, and linear algebra—so that sites most relevant to a query are listed at the top, where the user can most easily see them.

The vast number of pages and links on the Web can be represented as a graph in which the nodes are Web pages and the directed edges are links. Today's search engines determine the relevance of a page to a query by incorporating the importance of pages pointing to and from that page. Thus, when it comes to a search, a page's links can be just as important as its content. The final ranking comes from techniques in linear algebra and probability that help formulate and solve equations which, according to the founders of one search engine, involve millions of variables and billions of terms. In the future, search engines may use artificial intelligence and information on past searches to discern the actual intent of a query.

**For more information:** David Voss, "Better Searching Through Science," *Science*, 14 Sept. 2001



## Notices Search Results for 'algorithm + matching'

Documents 1 - 50 of 67 matches. More ★'s indicate a better match.

**Standing the Test of Time: The Data Encryption Standard, Volume 47, Number 3 ★★★★★**  
 ... impossible to break. With their reliance on elementary number theory, public-key systems have captured mathematicians' imagination. Then a private-key system ...  
<http://www.ams.org/notices/200003/fea-landau.pdf> 01/28/00, 116237 bytes

**The Cooley-Tukey FFT and Group Theory, Volume 48, Number 10 ★★★★★**  
 ... or Applied Mathematics?" This rhetorical question was answered by showing that in fact the finite Fourier transform and the family of efficient **algorithms** are of interest to both pure and applied ...  
<http://www.ams.org/notices/200110/fea-maslen.pdf> 10/17/01, 258632 bytes

**Karp and Smale Receive National Medals of Science ★★★**  
 ... for L is to decide, given an input x, whether  $x \in L$ . The set L is in the complexity class P if there exists an **algorithm** that solves the membership problem for L and runs in time bounded by ...  
<http://www.ams.org/notices/199612/comm-medal.pdf> 03/08/99, 142863 bytes

**Doctoral Degrees Conferred 1995--1996 ★★**  
 Doctoral Degrees Conferred 1996-1997 ALABAMA Auburn University (12) Discrete and Statistical Sciences Boling, Patricia, Bowtie **algorithm** for Steiner triple systems ...  
<http://www.ams.org/notices/199702/thesis.pdf> 03/08/99, 292554 bytes



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