1035-05-21   **Fan Chung*** (`fan@ucsd.edu`), 9500 Gilman Drive, La Jolla, CA 92093-0112. *The mathematics of PageRank.* Preliminary report.

PageRank is one of the main ways for determining the ranking of webpages by Web search engines. Based on relations in an interconnected network, PageRank has become a major tool for addressing fundamental problems arising in general graphs, especially for large information networks with hundreds of millions of nodes.

The mathematics of PageRank involves a vigorous interplay between numerous areas including spectral graph theory, random walks, probability and approximation algorithms, to name a few. The developments have in turn led to many beautiful and unexpected results in discrete, continuous and computational mathematics.

The applications of PageRank have grown far beyond its original scope of ranking webpages. In addition to finding hot spots and identifying hidden patterns in social and biological networks, PageRank also sheds light and provides mathematical insight to the vast world of information networks that surround us. (Received August 24, 2007)