Monday, 9:00–10:00

Room 148

Search Engines, Eigenvectors, and Chromatic Numbers

Herbert Wilf, University of Pennsylvania

A search engine can return a list of hits ranked in descending order of importance. How can they determine the importance of the web sites involved? The Kendall-Wei ranking scheme uses the Perron eigenvector of the matrix whose elements measure the influence of each site on the others. We will discuss this scheme, and the Perron-Frobenius theorem that underlies it. Applications will be given to web search, ranking of tournaments, football pools, etc.

1:30–2:30

Room 148

The Lean, Mean, Bijection Machine

Herbert Wilf, University of Pennsylvania

Beginning in the 1980's and continuing to the present, great strides have been made towards the goal of automating the discovery of bijective mappings that establish counting theorems in combinatorics. These include the Garsia-Milne Involution Principle, and later work by Remmel, Gordon, O'Hara, myself, and others. We'll survey these results, particularly as they apply to integer partitions, where they supply automated discovery and proof of theorems of the form "There are the same number of partitions of n such that ... as there are such that ...".