ABSTRACT

An independent set of a graph $G$ is a set of pairwise non-adjacent vertices. Let $\alpha(G)$ denote the cardinality of a maximum independent set and $f_s(G)$ the number of independent sets of $s$ vertices. The independence polynomial $I(G; x)$ defined first by Gutman and Harary has been the focus of considerable research recently. In this talk, we will first introduce some basic concepts and tools related to the independence polynomials of graphs, and then present some bounds for $f_s(G)$ when $G$ is a $k$-tree, a maximum $k$-degenerate graph or a compound graph. Furthermore, we will characterize graphs which attain the upper or lower bounds. Applying our results, we will derive some combinatorial identities. Finally, we will propose several further research problems.

BIOGRAPHY

Dr. Wei is a professor at University of Mississippi. He obtained his Ph.D. in Mathematics from Technical University of Berlin in Germany in 1992. Since that time, he has performed research at Academia Sinica. He was visiting professor at Georgia Institute of Technology and Georgia State University. He research interests lie in Graph Theory and Combinatorial Optimization. Particularly, his current research focuses on cycles, paths and factors in graphs, extreme problems in graphs, domination in graphs and independence polynomials of graphs. He has published over 80 research papers in professional journals.