The Maximization of Neighbor-Component Order Connectivity

Kristi Luttrell*, Daniel Gross, John T. Saccoman, Seton Hall University; L. William Kazmier-czak, Charles Suffel, Monika Heinig, Stevens Institute of Technology

The vulnerability parameter neighbor-component order connectivity is defined as the minimum number of closed neighborhoods that must be removed from a graph in order to ensure that all remaining components have order less than some given threshold value, k. Consider a network modeled by a graph G on n nodes and e edges. We denote neighbor-component order connectivity as $\kappa_{nc}^{(k)}(G)$ or simply $\kappa_{nc}^{(k)}$. We observe that the problem of computing the neighbor-component order connectivity of a network modeled by an arbitrary graph G for arbitrary k is NP-hard since $\kappa_{nc}^{(1)}(G) = \gamma(G)$, where $\gamma(G)$ is the domination number of G. In this talk, we will look at a result that ensures maximum neighbor-component order connectivity over all graphs having the same number of nodes and maximum degree.