Bonnie C. Jacob and Jobby Jacob* (jxjsma@rit.edu). Graph rankings based on $l_p$ norms.

For a graph $G$, a function $f : V(G) \rightarrow \{1, 2, \ldots, k\}$ is a $k$-ranking, if $f(u) = f(v)$ implies that every $u - v$ path contains a vertex $x$ such that $f(x) > f(u) = f(v)$. The rank number of a graph $G$ is the minimum value of $k$ such that $G$ has a $k$-ranking. Hence the rank number of a graph is obtained by applying the $l_\infty$ norm (max norm) to the vertex labels. Jamison and Narayan studied the rank numbers of graphs based on the $l_1$ norm (sum norm).

In this talk, we will look at rank numbers of graphs based on $l_p$ norms for $0 < p < \infty$. We will compare rank numbers based on $l_p$ norms for $0 < p < \infty$ to the traditional rank numbers for different classes of graphs. We will show that there are graphs such that the set of traditional optimal rankings and the set of $l_p$ optimal rankings are disjoint. (Received September 12, 2014)