

1044-05-225

**Robert R Rubalcaba\*** ([r.rubalcaba@gmail.com](mailto:r.rubalcaba@gmail.com)), United States Department of Defense, 9800 Savage Road, Fort George G. Meade, MD 20755, and **Peter D Johnson, Jr.** ([johnspd@auburn.edu](mailto:johnspd@auburn.edu)), Auburn University, Department of Mathematics and Statistics, 133B Allison Lab, Auburn, AL 36849. *Extremely Villainous Colorings.*

Suppose you have a minimum proper coloring of a graph, and then a villain rearranges your coloring so that it is no longer proper. Different methods of restoring this rearranged coloring to some minimum proper coloring are studied. Measures of two such methods are the villainy and weak villainy of a graph.

The villainy and weak villainy are computed for some classes of graphs including Mycielski graphs and Cartesian products. Some new extreme examples are presented, and open problems posed. Villainous and weak villainous rearrangements of proper colorings with at least  $k > \chi(G)$  colors are presented. (Received September 02, 2008)