Christos Mitillos, Illinois Institute of Technology

On Graph Fall-Coloring

Graph coloring deals with the partition of the vertices of a graph into sets, or color classes, of pairwise non-adjacent vertices. Graph domination studies sets of vertices which are within a distance of 1 from all vertices. Both concepts are often applied in real life scheduling and location problems on networks. We are interested in a common extensions of both these concepts.

Fall coloring of graphs, introduced by Dunbar et al. (2000) asks for a partition of the vertices of a graph into color classes, each of which is also a dominating set. We study the question: When does a graph have a fall-coloring?

Our results include characterization of fall-colorable threshold graphs and fall-colorable split graphs. We also study the fall-coloring of cartesian products of graphs and interval graphs. Finally, we construct a family of graphs which can be only fall-colored using predetermined, non-consecutive numbers of color classes.

The results represent joint work with Professor Hemanshu Kaul of the Illinois Institute of Technology.