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and **Hemanshu Kaul\*** (kaul@iit.edu), 10 West 32nd Street, Chicago, IL 60616. *Distinguishing  
Chromatic Number of Graphs.*

The distinguishing chromatic number of a graph  $G$ ,  $\chi_D(G)$ , is the least number of colors needed for a proper coloring of  $G$  with the property that the only color-preserving automorphism of  $G$  is the identity. That is, we want a proper coloring of a graph that breaks all its symmetries, so that the coloring together with the structure of the graph uniquely determines the vertices. This is an extension of both the chromatic number and the distinguishing number of graphs.

The chromatic number,  $\chi(G)$ , is an immediate lower bound for  $\chi_D(G)$ . We will survey some of the known results in this area, and show that  $\chi_D(G)$  can be surprisingly at most one worse than  $\chi(G)$  for  $G$  a Cartesian power of any graph. The main theorem is : For every graph  $G$ , there exists a constant  $d_G$  such that for all  $d \geq d_G$ ,  $\chi_D(G^d) \leq \chi(G) + 1$ , where  $G^d$  denotes the Cartesian product of  $d$  copies of  $G$ . Along the way, we also find the distinguishing chromatic number for Hypercubes, Cartesian products of complete graphs (Hamming graphs), and Cartesian products of complete multipartite graphs. (Received September 18, 2007)