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Christine T. Cheng* (ccheng@uwm.edu). *A poset-based approach to embedding median graphs in hypercubes and lattices.*

A *median graph* G is a graph where, for any three vertices u, v and w , there is a unique node that lies on a shortest path from u to v , from u to w , and from v to w . While not obvious from the definition, median graphs are *partial cubes*; that is, they can be isometrically embedded in hypercubes and, consequently, in integer lattices. The *isometric* and *lattice dimensions* of G , denoted as $dim_I(G)$ and $dim_Z(G)$, are the smallest integers k and r so that G can be isometrically embedded in the k -dimensional hypercube and the r -dimensional lattice respectively. Motivated by recent results on the cover graphs of distributive lattices, we study these parameters through *median semilattices*, a class of ordered structures related to median graphs. We show that not only does this approach provide new combinatorial characterizations for $dim_I(G)$ and $dim_Z(G)$, they also have nice algorithmic consequences. (Received August 24, 2010)