

Graphs Obtained from Collections of d -Dimensional Blocks

Stanley Florkowski, Pamela Kirkpatrick*, Garth Isaak, Lehigh University, Colton Magnant, Georgia Southern University

Let \mathcal{D} be a collection of internally disjoint d -dimensional blocks. We build a graph, $G(\mathcal{D})$ called a *block graph* by assigning to each block a distinct vertex and adding an edge between any pair of vertices whose corresponding blocks are *touching*. It is known that for $d \geq 3$, the chromatic number of block graphs is unbounded. Magnant, Nowbandegani, and Wang considered a restriction on \mathcal{D} which bounds the maximum ratio, $r(\mathcal{D})$ of side lengths of each block. We will show for $d \geq 3$ and bounded $r(\mathcal{D})$, that the chromatic number of $G(\mathcal{D})$ is also bounded. Additionally, we will show that the maximum clique number of a d -dimensional block graph is at most $d + 1$.

Keywords: intersection graphs, chromatic number, clique number