

---

**DOUGLAS B WEST**, Zhejiang Normal University and University of Illinois

*Online Sum Paintability: The Slow-Coloring Game*

The "slow-coloring game" is played by Lister and Painter on a graph  $G$ . On each round, Lister marks a nonempty subset  $M$  of the remaining vertices, scoring  $|M|$  points. Painter colors a subset of  $M$  that is independent in  $G$ . The game ends when all vertices are colored. Painter seeks to minimize the total score; Lister seeks to maximize it. The score under optimal play is the "slow-color cost" of  $G$ , written  $s(G)$ .

Trivial lower and upper bounds on  $s(G)$  are the chromatic sum and the sum-paintability, which are sharp. We give sharp upper and lower bounds on  $s(G)$  in terms of the independence number. We have a linear-time algorithm to compute  $s(G)$  exactly when  $G$  is a tree; among  $n$ -vertex trees, it is minimized by the star and maximized by the path (where it equals  $3n/2$ ). We give good bounds on  $s(K_{r,s})$ . (Joint with Thomas Mahoney and Gregory Puleo.)