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Directed Visibility Number for Planar Digraphs and Tournaments

The directed visibility number $b(G)$ of a digraph G is the minimum k such that each vertex of G can be represented by at most k horizontal segments in $\mathbb{R}^2$ with each arc (u, v) of G is realized by an upward visibility from a u-segment to a v-segment. We show that directed planar digraphs have $b(G) \leq 4$, and outerplanar digraphs have $b(G) \leq 3$. Also, every n-tournament has $b(G) \leq (n + 1)/3 + 3$ and large transitive tournaments satisfy $b(G) \leq (3n + 11)/14 + 41$.