

The Turán number of the grid

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For a positive integer t , let F_t denote the graph of the $t \times t$ grid. Motivated by a 50-year-old conjecture of Erdős about Turán numbers of r -degenerate graphs, we prove that there exists a constant $C = C(t)$ such that $\text{ex}(n, F_t) \leq Cn^{3/2}$. This bound is tight up to the value of C . One of the interesting ingredients of our proof is a novel way of using the tensor power trick.