Excluded Grid Theorem: Improved and Simplified

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Abstract:

One of the key results in Robertson and Seymour's seminal work on graph minors is the Excluded Grid Theorem. The theorem states that for every fixed-size grid H, every graph whose treewidth is large enough, contains H as a minor. This theorem has found many applications in graph theory and algorithms. Let $f(k)$ denote the largest value, such that every graph of treewidth k contains a grid minor of size $(f(k) \times f(k))$. Until recently, the best known bound on $f(k)$ was sub-logarithmic in k. In this talk we will survey new results and techniques that establish polynomial bounds on $f(k)$.

Partly based on joint work with Chandra Chekuri.