Equitable List Coloring of Sparse Graphs

Zimu Xiang
University of Illinois Urbana-Champaign

Time: Mar 3rd , 10:00 - 11:00
Tencent meeting ID: 883574069 Password: 235711

Abstract: For a list assignment L of k colors to each vertex of an n-vertex graph G, an equitable L-coloring of G is a proper vertex coloring of G such that no color is used more than $\lceil n/k \rceil$ times. Call a graph equitably k-choosable if it has an equitable L-coloring for every k-list assignment L. A graph G is (a,b)-sparse if for every nonempty vertex subset A, the number of edges in the induced subgraph $G[A]$ is at most $a|A| + b$.

We determine the sharp sparsity bounds in terms of (a,b) that guarantee a graph with minimum degree at least 2 to be equitably k-choosable for $k = 3,4,5$. One of the tools in the proof is the new notion of strongly equitable (SE) list coloring. This notion is both stronger and more natural than equitable list coloring; and our upper bounds are for SE list coloring.

This is joint work with Hal Kierstead and Alexandr Kostochka.