

Some Properties of Lovász's Theta Number

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Lovász's theta number Θ is an interesting polynomial time calculable graph parameter, which provides a simultaneous bound on clique number and chromatic number for any graph G :

$$\omega(G) \leq \Theta(G) \leq \chi(G).$$

It has practical value by allowing to heuristically extract actual colourings and cliques as a by-product of its calculation using semidefinite programming.

We are looking at applying such heuristics in particular to highly symmetric graphs and investigate some relationships between Θ and the fractional chromatic number.

For the most part, the work is (going to be) part of a doctoral thesis written by Igor Dukanovic at the University of Klagenfurt.