

Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, September 10

Speaker: Kyle Murphy, Iowa State University

Flexibility of Planar Graphs

Introduced by Dvořák, Norin, and Postle, flexibility is an extension of the standard list coloring problem on graphs where a handful of vertices have a request for a specific color. Flexibility could be used to model scheduling problems in which people have requests for specific time slots. If k vertices of a graph G have a request, then G is ε -flexible if we can satisfy at least εk requests for all possible values of k . Using discharging, Dvořák, Masařík, Musílek, and Pangrác showed that there exists such an $\varepsilon > 0$ for all triangle-free planar graphs with lists of size 4. In this talk, I will discuss graph coloring, list coloring, and some applications. Additionally, I will discuss the discharging method, which was used to prove the Four Color Theorem, and how to apply discharging to flexibility. Finally, I will review joint work with Lidický, Masařík, and Zerbib in which we applied similar methods to prove that a planar graph G not containing a C_5 , C_6 , C_7 , K_4 , or a book of size 3 is also ε -flexible with lists of size 4.

