



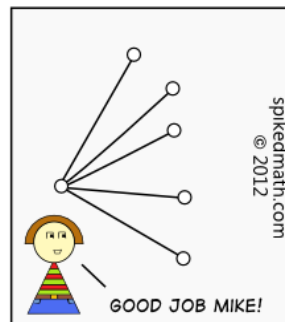
CoSP – DIMACS REU SEMINAR TALK
Tuesday, June 16, 2020, 12:00am EDT
Webex meeting

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Many Disjoint Triangles in Co-Triangle-Free Graphs

HOW A GRAPH THEORIST
DRAWS A "STAR":



Abstract

One of the classical results in extremal graph theory, Goodman's theorem, states that whenever the edges of a complete n -vertex graph are colored red or blue, there will be at least $(1-o(1))n^2/24$ monochromatic triangles. In other words, about a quarter of all possible triangles are guaranteed to be monochromatic.

Erdos asked a similar question about the smallest number of *edge-disjoint* monochromatic triangles in every such coloring. He conjectured that the answer should be $(1-o(1))n^2/12$, which is achieved by one color class being the disjoint union of two cliques of order $n/2$.

I will present a recent proof of this fact in the class of colorings where one of the color classes is triangle-free. Put differently, we show that the complement of any triangle-free n -vertex graph contains at least $(1-o(1))n^2/12$ edge-disjoint triangles.