

Some Recent Results in Three Areas of Matching Theory

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This talk deals with three topics in matching theory:

1. Extending matchings in planar triangulations. It seems "easier", somehow, to extend independent edges in a graph to a perfect matching if the edges are "relatively far apart". We will present some results aimed at quantifying this statement when the graphs involved are triangulations of the plane.

2. Matching in domination-critical graphs. A graph is domination-critical if the domination number decreases when any missing edge is added. Such graphs are far from understood even when the domination number is 3. We will present some results on toughness and matching in such graphs.

3. Forbidden subgraphs and bounds on the size of a maximum matching. A well-known theorem due, independently, to Sumner and Las Vergnas, states that a connected claw-free graph on an even number of vertices has a perfect matching. What, then, can be said about the size of a maximum matching when subgraphs other than the claw are forbidden? The answer may surprise you.

The above is joint work with, variously, Robert Aldred, Nawarat Ananchuen, Ken-ichi Kawarabayashi and Akira Saito.