MATCHING EXTENSION IN GRAPHS EMBEDDED IN SURFACES

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When does every edge of a graph lie in some perfect matching? This is a famous and well understood problem. But suppose we want every pair of (independent) edges to lie in a perfect matching or every $n$ (independent) edges to lie in a perfect matching? And maybe we want to avoid certain edges in our perfect matching as well.

Intuition tells us that an increase in the mutual distance among the edges to be matched seems to make our task easier. But how to quantify this?

Such questions have motivated the development of the area of matching extension in graphs over the past 35 years or so. One of the subareas most recently studied is topological matching extension in which we seek to extend matchings in graphs embedded in surfaces (orientable or nonorientable) with, and without, face-width considerations.

A survey of progress in this area will be presented.