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**Andrew Meier\*** (ameier@nebrwesleyan.edu), **Austin Mohr** (amohr@nebrwesleyan.edu) and **Thomas Schuler** (tschule2@nebrwesleyan.edu). *Pruning techniques for SUBGRAPH ISOMORPHISM using matchings and vertex cuts*. Preliminary report.

Given two graphs, called the host and the pattern, SUBGRAPH ISOMORPHISM is the problem of determining whether the host contains a subgraph that is isomorphic to the pattern. We describe new techniques involving the theory of graph matchings and vertex cuts that appear to greatly reduce the search space involved in SUBGRAPH ISOMORPHISM. Matchings are used to avoid the exploration of branches in the depth-first search tree in which a large subset of the pattern vertices must be mapped to a smaller subset of the host vertices. Vertex cuts are used to prioritize vertex assignments in such a way that the host is quickly broken into connected components, which allows one to proceed recursively on each of the (much simpler) components. Our observations about cut vertices are most effective in the special case of SPANNING SUBGRAPH ISOMORPHISM, wherein the host and pattern are of equal order. We conclude with empirical data for several instances of SPANNING SUBGRAPH ISOMORPHISM, all of which suggest that the consideration of matchings and vertex cuts yields a great reduction in runtime. (Received September 20, 2016)