

Disjoint paths in tournaments

Date Tuesday, September 21

Time 4 pm

Location 303 Mudd

Abstract: Given k pairs of vertices of a tournament, how can we test in polynomial time (for fixed k) whether there are k directed paths joining the pairs, pairwise edge-disjoint? For $k = 2$ there is an algorithm due to Bang-Jensen; but recently we (joint with Fradkin) found an algorithm for all fixed k . It uses results about cutwidth which we explain.

What if, instead, we require the paths to be pairwise vertex-disjoint? For $k = 2$, there was an algorithm by Bang-Jensen and Thomassen; but very recently we (joint with Chudnovsky and Scott) found an algorithm for all fixed k . This is much more complex than the edge-disjoint question, and uses completely different methods, which we explain.

It turns out that we can also answer the following question in polynomial time, for fixed k – given k pairs in a tournament, as before, and k integers, can we choose the paths, pairwise vertex-disjoint, such that each path has length at most the corresponding integer?