Title: Decomposing a graph into paths, part 2

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Abstract

I will highlight in this talk the two main ingredients of our proof with Julien Bensmail, Ararat Harutyunyan and Tien-Nam Le that every 24-edge connected graph with high minimum degree can be edge-decomposed into paths of fixed length.

The first result is that every graph with high minimum degree can be decomposed into paths having few conflicts.

The second result is that every 4-edge connected graph G with large minimum degree contains a near spanning path-forest (the edges of the forest being paths of length k, and "near spanning" meaning spanning tree minus one edge).

This latter result implies that every parity vector (with the obvious necessary requirements) on the vertices of G can be realized as a sum of parity vectors of paths of length k.

This suggests that when a graph is highly connected, its set of copies of a given tree T is "dense enough" in the sense that any (reasonable) vector of values mod r can be realized as a sum of disjoint copies of T.

This is related to a conjecture of Jaeger about subset sums in vector spaces, which quite unexpectedly leads to a permanent vs determinant problem. I will say few words on this topic.