SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Mathematics Department

H-Decompositions of Graphs

Teresa Maria Sousa

(PI)

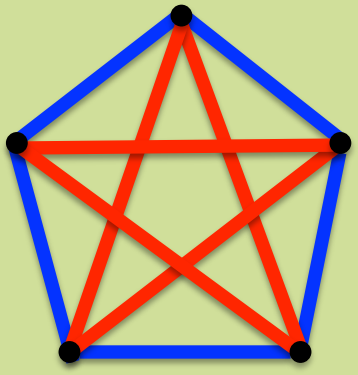
Ph.D.,
Algorithms, Combinatorics and Optimization

Carnegie Mellon University
2006

Objectives

Given a fixed graph H we want to find the smallest number, f(n,H), such that any graph of order n admits an H-Decomposition with at most f(n,H) elements.

In the monochromatic H-decomposition problem we want to find the smallest number, f(n,H,k), such that any k-edge-colored graph on n vertices admits a monochromatic H-Decomposition with at most f(n,H,k) elements.



Ramsey coloring for K_3

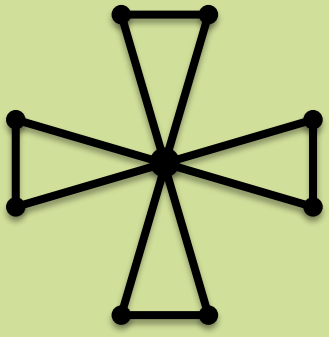
Methodology

The H-decompositon problem is a problem in extremal graph theory. The tools used involve a wide range of methods, going from simple induction, to Szemeredi´s Regularity Lemma or the Stability Method. Results known about the packing number of a graph are also widely used. Monochromatic H-Decompositions are closely related with the Ramsey Numbers.

Expected Results

The *k-fan graph*, denoted by F_k, is the graph consisting of k triangles intersecting in exactly on common vertex.
We expect to determine the function $f(n,F_k)$, for all $k \geq 2$.

For Monochromatic decompositions we expect to determine the value of the function $f(n,K_r,k)$, for all $r \geq 3$ and $k \geq 2$, where K_r denotes the complete graph on r vertices.



4-Fan graph

Funding: Projecto PTDC/MAT/113207/2009 financiado pela Fundação para a Ciência e a Tecnologia.