1049-52-202 **Jesus A De Loera*** (deloera@math.ucdavis.edu), Davis, CA 95616. *Subgraph Isomorphism through Polynomial Ideals and their relaxations.*

Given two graphs G and H, the *subgraph isomorphism problem* asks whether there is a subgraph of G isomorphic to H. Instances of this question include a wide range of famous questions in Graph Theory (e.g. graph isomorphism, existence of hamiltonian cycles or cliques, etc).

We investigate the convex-algebraic-geometric nature of such questions. Starting with a non-linear encoding of the problem using polynomial ideals we present a hierarchy of relaxations each yielding relevant computational information. In particular, we derived some results on the estimation the number of distinct isomorphic subgraph inside G and connections to the multiplicity of eigenvalues of the adjacency matrices of G and H.

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