

Geometric Sensitivity of Rigid Graphs

Tibor Jordán

Department of Operations Research
Eötvös Loránd University, Budapest

Let (G, p) be an infinitesimally rigid bar-and-joint framework and let L be an equilibrium load on p . The load can be resolved by appropriate stresses $w_{i,j}$, $ij \in E(G)$, in the bars of the framework. Our goal is to identify the following parts (zones) of the framework:

(i) when the location of an unloaded joint v is slightly perturbed, and the same load is applied, the stress will change in some of the bars. We call the set of these bars the *influenced zone of v* (with respect to L, p and the modified configuration p'),

(ii) let S be a designated set of joints and suppose that each joint with a non-zero load belongs to S . The *active zone of S* , with respect to p and L , is the set of those bars in which the stress, which resolves L , is non-zero.

We show that if (G, p) is generic and $d = 2$ then, for almost all loads, these zones depend only on the graph G of the framework and can be computed by efficient combinatorial methods.

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