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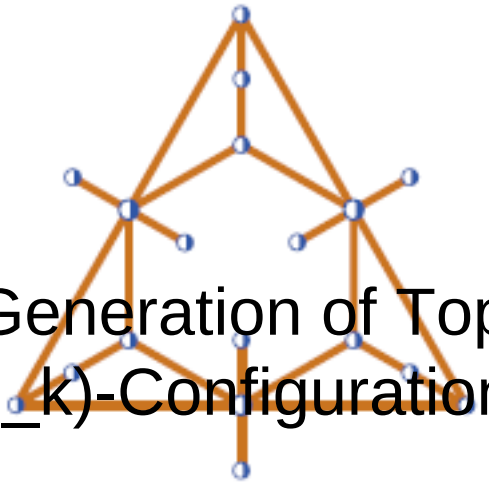

On the Generation of Topological (n_k)-Configurations

Content :

We have combinatorial, topological, and geometric (n_k)-configurations in the projective plane, i.e., n lines (combinatorial ones, pseudolines, or straigth lines) and n points and precisely k of these points are incident with each line and, vice versa, precisely k lines are incident with each point, see Grünbaum´s research monograph: "Configurations of Points and Lines", AMS, Graduate Studies in Mathematics, Vol 103, 2009. We provide an algorithm for generating all topological (n_k)-configurations in the projective plane for given n and k without determining first all corresponding abstract (n_k)-configurations. Apart from its interest in its own right, the algorithm might lead to solutions of several problems in the theory of configurations. In the talk we also mention a non-orientable manifold associated to each (n_k)-configuration that will be published in a common paper of Ricardo Strausz, UNAM, México and the author.
The Haskell version of the algorithm of the author has been used by Vincent Pilaud, maître de conférences, University Montpellier, France, to write a very effective Java version of the algorithm. A corresponding common paper of the author with him about the algorithm and with first results of the algorithm has been submitted to the 23rd Canadian Conference on Computational Geometry (CCCG'11), to be held in Toronto, August 10-12, 2011.

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