

Determinantal facet ideals

Matteo Varbaro

Given a generic $r \times n$ matrix X ($r \leq n$) and a subset C of the maximal minors of X , we denote by J_C the ideal of the polynomial ring $k[X]$ generated by the maximal minors of C : such ideals are called determinantal facet ideals. By definition the scheme $\text{Spec}(k[X]/J_C)$ parametrizes the matroids realizable over the field k on a ground set of n vertices and rank $\leq r$ where each element of C corresponds to a dependent set of the matroid. As it turns out, J_C is in general not reduced. It is reduced for $r = 2$, since in this case J_C is a binomial edge ideal, and in general we will see that it is reduced for a large class of C . Further related results and questions will be presented. This is based on a joint work with Bruno Benedetti and Lisa Seccia.