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Distinguishing k-configurations

A k-configuration in the projective plane is a collection of points, subject to certain geometric conditions, introduced by Roberts and Roitman to study Hilbert functions of graded algebras. If d is the maximal number of colinear points in a k-configuration, then there can be anywhere between 1 and $d+1$ distinct lines containing exactly d points of the k-configuration. The number of such lines is not detected by the usual invariants of the defining ideal of the k-configuration. Instead, I will illustrate how this number of lines is encoded in the Hilbert function of a high enough symbolic power of the defining ideal of the k-configuration. This talk is based on joint work with Y.S. Shin and A. Van Tuyl (arXiv:1705.09195).