Alessio Sammartano

Fall 2017: PhD at Purdue University, advisor Giulio Caviglia

Spring 2018: MSRI, Postdoctoral Fellow in the Complementary Program

From Fall 2018: postdoc at University of Notre Dame

Research interests: Commutative algebra

In particular: syzygies, Hilbert functions, blowup algebras, determinantal rings; combinatorial and computational aspects.

Bounds on free resolutions

Let $X \subseteq \mathbb{P}^n$ be a complete intersection of r hypersurfaces of degrees $d_1, d_2, \ldots, d_r$.

Fix a Hilbert polynomial $p(z)$. For a closed subscheme $Y \in \mathrm{Hilb}^{p(z)}(X)$ consider

$$0 \to S^{\beta_m} \to S^{\beta_{m-1}} \to \cdots \to S^{\beta_1} \to S^{\beta_0} \to I_Y \to 0 \qquad \text{where } S = \mathbb{K}[x_0, \ldots, x_n].$$

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Defining equations of $\mathbb{K}$-algebras

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Ex.1 $f_0, \ldots, f_s =$ minors of a matrix of linear forms;

Ex.2 $f_0, \ldots, f_s =$ square-free monomials corresponding to the bases of a matroid.