

Multihomogeneous resultants

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In this talk, I will consider the sparse multihomogeneous resultant, an irreducible polynomial in the coefficients of an overdetermined system of multihomogeneous polynomials, whose vanishing is equivalent to the existence of a common solution in a corresponding product of projective spaces. Resultants provide efficient ways for studying and solving polynomial systems.

In joint work with Ioannis Emiris, we study multihomogeneous systems through the determinant of a resultant complex, following ideas of Weyman and Zelevinsky. We develop methods for classifying and constructing determinantal formulae for the sparse resultant, i.e. matrices whose determinant equals the resultant.

I will also relate these methods to the description of syzygies, following joint work with David Cox and Hal Schenck.