Theory and Applications of Numerical Algebraic Geometry

Presented by

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Abstract: Polynomials are everywhere. Designing windshield wiper mechanisms, modeling stoichiometric chemical reactions, nonlinear optimization and control, and many other scenarios, all generate polynomial systems -- and demand they be solved. The functions can be univariate, or multivariate. The systems can be structured, or dense. The solutions can be sets of points, or entire positive-dimensional spaces. And they can be computed in a variety of ways.

Numerical algebraic geometry is a field of computational mathematics which solves and manipulates polynomial systems primarily using numerical continuation, in contrast to symbolic algebraic geometry, which does so by operating on algebraic expressions. The field is highly application-driven, and continues to mature, both in terms of theoretical boundaries, and software implementations. This talk will discuss numerical algebraic geometry -- its motivations, incarnations, and applications.

"Dr. Brake is a candidate for an open position in the department"

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