

1124-14-400

Brent R. Davis* (davisb@math.colostate.edu), **E. Gross, K. Ho, D. Bates** and **H. Harrington**. *Numerical algebraic geometry for model selection*.

Researchers working with mathematical models are often confronted by the related problems of parameter estimation, model validation, and model selection. These are all optimization problems, well-known to be challenging due to nonlinearity, non-convexity and multiple local optima. Furthermore, the challenges are compounded when only partial data is available. Here, we consider polynomial models (e.g., mass-action chemical reaction networks at steady state) and describe a framework for their analysis based on optimization using numerical algebraic geometry. Our approach exploits the geometric structures relating models and data, and we demonstrate its utility on examples from the life sciences. (Received September 13, 2016)