

1096-68-284

**Despina Stasi\***, despina@psu.edu, and **Sonja Petrovic** and **Elizabeth Gross**. *Toric Geometry of Hypergraphs*.

Social networks and other large sparse data sets pose significant challenges for statistical inference, as many standard statistical methods for testing model/data fit are not applicable in such settings. Algebraic statistics offers a theoretically justified approach to goodness-of-fit testing that relies on the theory of Markov bases and is intimately connected with the geometry of the model as described by its fibers.

Current practices require the computation of the entire basis, which is infeasible in many practical settings. We present a dynamic approach to explore the fiber of a model, which bypasses this issue. Our algorithm is based on the toric geometry of hypergraphs. The running example is the  $p_1$  model for social networks, a statistical model of random directed graphs with reciprocation. (Received August 26, 2013)