



The University of Chicago

Department of Statistics

Seminar Series

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“Algebraic Factor Analysis: Tetrads, Pentads and Beyond”

MONDAY, January 30, 2006 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

Abstract: Factor analysis refers to a statistical model in which observed variables are conditionally independent given fewer hidden variables, known as factors, and all the random variables follow a multivariate normal distribution. The parameter space of a factor analysis model is a subset of the cone of positive definite matrices. This parameter space is studied from the perspective of computational algebraic geometry. Grobner bases and resultants are applied to compute the ideal of all polynomial functions which vanish on the parameter space. These polynomials, known as model invariants, arise from rank conditions on a symmetric matrix under elimination of the diagonal entries of the matrix. Besides revealing the geometry of the factor analysis model, the model invariants also furnish useful statistics for testing goodness-of-fit.

This talk is based on the paper with Bernd Sturmfels and Seth Sullivant which is posted at <http://front.math.ucdavis.edu/math.ST/0509390>.