Algebraic Statistics

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The work of Diaconis and Sturmfels [1] on sampling conditional distributions initiated the use of computational algebra, combinatorics, and (convex) optimization, to represent and gain an insight on the structural properties of statistical models and inference. This line of research has now the name Algebraic Statistics. The basic object study is the algebraic statistical model; a set of probability distributions defined by polynomial constraints or parametrizations that are rational maps. Of particular interest are Gaussian Graphical models, that capture the statistical relations between jointly normal random variables using a graph; and their generalization Exponential Varieties. The goal is to understand in depth the current results [2,3] on the subject and the interplay between statistics, optimization, and algebraic algorithms.

Bibliography

