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In statistics, hypothesis testing seeks to determine whether or not given data is likely to have been produced by a given model. One way to describe the way that data can result from a model is through the algebraic process of implicitization. In general, implicitization produces polynomial equations vanishing on an algebraic variety, such as the Zariski closure of the set of set of probabilities for a model. I will talk about some ways by which implicit equations can be used for statistical hypothesis testing on matrices and tensors, starting from a re-interpretation of the chi-square test and working up to higher order tensors. (Received September 22, 2011)