

STATISTICS SEMINAR

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Title: **Contingency tables from the algebraic statistics viewpoint**

Abstract

Contingency tables are governed by a hierarchical model. We explain how to choose between two hierarchical models by the method of Bayes factor. With this aim we consider each model as an exponential family on a certain polytope and take as a prior distribution a member of the Diaconis-Ylvisaker conjugate family with a probability element

$$d\pi(\theta; \alpha, m) = \exp(\alpha(\langle \theta, m \rangle - k(\theta))) \frac{d\theta}{I(m, \alpha)}$$

where k is the cumulant function and $I(m, \alpha)$ the crucial normalizing constant. We study the behavior of $I(m, \alpha)$ and of the Bayes factor when $\alpha \rightarrow 0$. If N is the number of facets of the polytope containing the sample mean, we give an explicit formula in terms of N for the asymptotic behavior for the Bayes factor.