UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

Friday 15 November, 2.00 p.m.

Lecture Room 273 (Level 2, Carslaw Building)

Unravelling mixtures of binomial distributions: a geometric approach to maximum likelihood estimation of the mixing distribution

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Abstract

Given a mixture of binomial distributions, how do we estimate the mixing distribution? This is a problem which arises in many contexts, from assessing "true ability" in psychology, to determining the proportion of defective kiwi fruit in a batch which has been cool-stored.

This seminar will build on earlier work of Bruce Lindsay and explore the geometry underlying this question, bringing out the key role played by cyclic polytopes. A resulting maximum likelihood fitting algorithm will be described and numerical examples used to illustrate the method. Problems over the lack of identifiability of the mixing distribution in part disappear. The method provides a classical alternative to the usual Bayesian approach to this problem, where a beta mixing distribution is assumed.

The talk will be fairly visual, with plenty of real examples.

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