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STATISTICS COLLOQUIUM

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Exploring Clustering Structure in Ranking Data

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133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

Cluster analysis is concerned with finding homogeneous groups in a population. Model-based clustering methods provide a framework for developing clustering methods through the use of statistical models. This approach allows for uncertainty to be quantified using probability and for the properties of a clustering method to be understood on the basis of a well defined statistical model. Mixture models provide a basis for many model-based clustering methods.

Ranking data arise when judges rank some or all of a set of objects. Examples of ranking data include voting data from elections that use preferential voting systems (eg. PR-STV) and customer preferences for products in marketing applications.

A mixture of experts model is a mixture model in which the model parameters are functions of covariates. We explore the use of mixture of experts models in cluster analysis, so that clustering can be better understood. The choice of how and where covariates enter the mixture of experts model has implications for the clustering performance and the interpretation of the results.

The use of covariates in clustering is demonstrated on examples from studying voting blocs in elections and examining customer segments marketing.

This work was completed in collaboration with Claire Gormley.

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