

## **The Clustering-Function-Based Method: Formulation, Computation and Applications**

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Cluster analysis (unsupervised learning) is widely applied in many areas, including image processing, machine learning, taxonomy, archaeology, and the social sciences such as market research. This talk summarises a recently developed clustering method, the clustering-function-based method, including its formulation, computational issues, and applications.

Motivated by the MANOVA model and the method of maximum likelihood, a clustering problem is formulated as a least squares optimisation problem, simultaneously solving for both a vector of unknown group membership of objects and a linear clustering function. This formulation is shown to be linked to linear regression analysis and Fisher linear discriminant analysis. The computation of the clustering-function-based method is based on sign eigenanalysis. Various computational issues for the clustering-function-based method will be discussed. Finally, applications to gene expression data will be investigated.

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