HOKKAIDO UNIVERSITY

Title	Multi-Dimensional Mass Estimation and Mass-based Clustering
Author(s)	Ting, Kai Ming
Description	ERATOセミナ2010 : No.28. 2010年11月19日
Relation	2010年度科学技術振興機構ERATO湊離散構造処理系プロジェクト講究録. p.188.
Issue Date	2011-06
Doc URL	https://hdl.handle.net/2115/48457
Type	conference presentation
File Information	28_all.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

ERATO セミナ 2010 - No. 28

Multi-Dimensional Mass Estimation and Mass-based Clustering

Kai Ming Ting
Gippsland School of Information Technology, Monash University

2010/11/19

概要

Mass estimation, an alternative to density estimation, has been shown recently to be an effective base modelling mechanism for three data mining tasks of regression, information retrieval and anomaly detection. This talk reports two advancements of the first work on mass estimation. First, we generalize the previously proposed one-dimensional mass estimation to multidimensional mass estimation, and significantly reduce the time complexity to $O(\psi h)$ from $O(\psi^h)$-making it feasible for a full range of generic problems. Second, we introduce the first clustering method based on mass-it is unique because it does not employ any distance or density measure. The structure of the new mass model enables different parts of a cluster to be identified and merged without expensive evaluations. The characteristics of the new clustering method are: (i) it can identify arbitrary-shape clusters; (ii) it is significantly faster than existing density-based or distance-based methods; and (iii) it is noise-tolerant.