

Efficiency for freight delivery by clustering

Public examination of a doctoral dissertation in the field of Computer Science

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Date and venue: 25.6.2015 at 12 noon, M100, Metria, Joensuu campus

Language of the dissertation: English

Language of the public examination: English

Clustering aims at associating similar objects to same groups and different objects to different groups. Many algorithms have been developed to this computationally difficult problem. In this dissertation, it is shown that a goodness criterion of clustering, the mean squared error (MSE) can be expressed as an analytic function. This allows standard optimization methods to be used.

A new way to do clustering is also presented. In it the data is fitted to a model, which is counterclockwise than in traditional clustering. Then the data is gradually transformed into original data keeping the clustering result good in this transform.

An additional constraint is given to clustering: we want to keep the mean squared error good, but we also want to keep the sizes of the clusters balanced. This is achieved by setting a suitable cost function or keeping the balanced clusters mandatory constraint. Balanced clustering is useful for example in making freight delivery efficient: we want that for each car the traversed route is as short as possible, but so that the number of visited places are in balance between cars.

The doctoral dissertation of MSc (Tech.) Mikko Malinen entitled New Alternatives for k-Means Clustering will be examined at the Faculty of Science and Forestry. The opponent in the public examination will be Professor Refael Hassin, Tel-Aviv University, Israel and the custos will be Professor Pasi Fränti, University of Eastern Finland. The public examination will be held in English.