Piyatida Rujasiri 2009: The Comparison of Clustering Techniques for ClusterAnalysis. Master of Science (Statistics), Major Field: Statistics, Department ofStatistics. Thesis Advisor: Assistant Professor Boonorm Chomtee, Ph.D. 185 pages.

The objective of this research is to compare effectiveness of the 5 clustering techniques for multivariate data; these techniques consist of Hierarchical clustering method, K-means clustering algorithm, Kohonen's Self-Organizing Maps method (SOM), K-medoids method and K-medoids method integrated with Dynamic Time Warping distance measure (DTW). To evaluate these 5 techniques, Root Mean Square Standard Deviation (RMSSTD) and R Squared (RS) are used to be the criteria. For RMSSTD, the lower value is the better technique and for RS, the higher value is the better technique. These approaches are evaluated by using both real and simulated data which are multivariate normally distributed. Each datasets were generated by Monte Carlo technique with 25, 100 and 300 sample sizes and repeated 1,000 times for 3, 5 and 7 variables. In this research, 2-15 clusters are studied. For the results, both real and simulated datasets provide the same result. That is, K-means clustering method yields the lowest RMSSTD and highest RS for almost situations. Therefore, K-means is the most suitable algorithm of clustering techniques for cluster analysis, except categorizing 25-sample dataset to 4 or 5 clusters which Ward linkage gives the best clustering result. In addition, increasing the number of clusters trends to increase the efficiency of the 5 clustering methods. However, the number of variables and the size of dataset do not affect to the efficiency of the 5 clustering methods.