













- [4] Y. Zhao and G. Karypis, "Evaluation of hierarchical clustering algorithms for document datasets," in *Proc. of CIKM*, pp. 515–524, 2022.
- [5] S. Sharma, *Applied Multivariate Techniques*, New York, NY, USA: John Wiley & Sons, Inc., vol. 2, 2008.
- [6] M. Halkidi, Y. Batistakis, and M. Vazirgiannis, "On clustering validation techniques," *Journal of Intelligent Information Systems*, vol. 17, pp. 107–145, 2001.
- [7] L. Hubert and P. Arabie, "Comparing partitions," *Journal of Classification*, vol. 2, no. 1, pp. 193–218, 1985.
- [8] T. Calinski and J. Harabasz, "A dendrite method for cluster analysis," *Comm. in Statistics*, vol. 3, no. 1, pp. 1–27, 1974.
- [9] J. Dunn, "Well separated clusters and optimal fuzzy partitions," *J. Cybern.*, vol. 4, no. 1, pp. 95–104, 1974.
- [10] P. Rousseeuw, "Silhouettes: A graphical aid to the interpretation and validation of cluster analysis," *J. Comput. Appl. Math.*, vol. 20, no. 1, pp. 53–65, 1987.
- [11] D. Davies and D. Bouldin, "A cluster separation measure," *IEEE PAMI*, vol. 1, no. 2, pp. 224–227, 1979.
- [12] X. L. Xie and G. Beni, "A validity measure for fuzzy clustering," *IEEE PAMI*, vol. 13, no. 8, pp. 841–847, 1991.
- [13] M. Kim and R. S. Ramakrishna, "New index for cluster validity assessment," *Pattern Recogn. Lett.*, vol. 26, no. 15, pp. 2353–2363, 2005.
- [14] M. Halkidi, M. Vazirgiannis, and Y. Batistakis, "Quality scheme assessment in the clustering process," in *Proc. PKDD*, London, UK, pp. 265–276, 2000.
- [15] M. Halkidi and M. Vazirgiannis, "Clustering validity assessment: Finding the optimal partitioning of a data set," in *Proc. ICDM*, Washington, DC, USA, pp. 187–194, 2001.
- [16] S. Saha and S. Bandyopadhyay, "Application of a new symmetry-based cluster validity index for satellite image segmentation," *IEEE Geoscience and Remote Sensing Letters*, 2008.
- [17] M. Halkidi and M. Vazirgiannis, "Clustering validity assessment using multi-representatives," in *Proc. Hellenic Conference on Artificial Intelligence*, 2002.
- [18] R. Tibshirani, G. Walther, and T. Hastie, "Estimating the number of clusters in a data set via the gap statistic," *J. Royal Statistical Society*, vol. 63, no. 2, pp. 411–423, 2001.
- [19] B. S. Y. Lam and H. Yan, "A new cluster validity index for data with merged clusters and different densities," in *Proc. IEEE ICSMC*, 2005, pp. 798–803.
- [20] J. MacQueen, "Some methods for classification and analysis of multivariate observations," in *Proc. BSMSP*, 1967, pp. 281–297.
- [21] G. Karypis, Cluto – Software for clustering high-dimensional datasets," *Version*, vol. 2, no. 2, 2006.
- [22] H. Xiong, J. Wu, and J. Chen, "K-means clustering versus validation measures: a data distribution perspective," in *Proc. KDD*, New York, NY, USA, 2006, pp. 779–784.
- [23] M. Ester, H. P. Kriegel, J. Sander, and X. Xu, "A densitybased algorithm for discovering clusters in large spatial databases with noise," in *Proc. KDD*, 1996, pp. 226–231.
- [24] G. Karypis, E.-H. S. Han, and V. Kumar, "Chameleon: Hierarchical clustering using dynamic modeling," *Computer*, vol. 32, no. 8, pp. 68–75, 1999.

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