An incremental density-based clustering framework using fuzzy local clustering. (English) Zbl 07437574 Inf. Sci. 547, 404-426 (2021)

Summary: This paper presents a novel incremental density-based clustering framework using the one-pass scheme, named Fuzzy Incremental Density-based Clustering (FIDC). Employing one-pass clustering in which each data point is processed once and discarded, FIDC can process large datasets with less computation time and memory, compared to its density-based clustering counterparts. Fuzzy local clustering is employed in local clusters assignment process to reduce clustering inconsistencies from one-pass clustering. To improve the clustering performance and simplify the parameter choosing process, the modified valley seeking algorithm is used to adaptively determine the outlier thresholds for generating the final clusters. FIDC can operate in both traditional and stream data clustering. The experimental results show that FIDC outperforms state-of-the-art algorithms in both clustering modes.

MSC:
62H86 Multivariate analysis and fuzziness
62H30 Classification and discrimination; cluster analysis (statistical aspects)

Keywords:
incremental clustering; density-based clustering; fuzzy clustering; stream data clustering

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References:
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