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A Topological-Based Spatial Data Clustering

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Abstract: An approach is presented that automatically discovers different cluster shapes that are hard to discover by traditional clustering methods (e.g., non-spherical shapes). This allows discover useful knowledge by dividing the datasets into sub clusters; in which each one have similar objects. The approach does not compute the distance between objects but instead the similarity information between objects is computed as needed while using the topological relations as a new similarity measure. An efficient tool was developed to support the approach and is applied to a multiple synthetic and real datasets. The results are evaluated and compared against different clustering methods using different comparison measures such as accuracy, number of parameters, time complexity, and visually inspection. The tool performs better than error-prone distance clustering methods in both the time complexity and the accuracy of the results.