



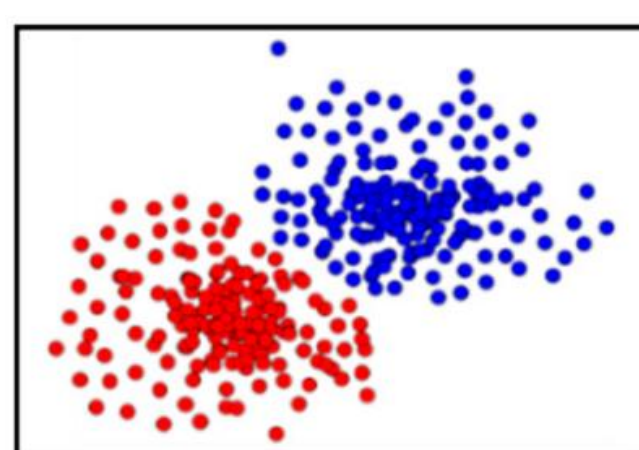
A Novel Spatial Clustering Method based on Delaunay Triangulation

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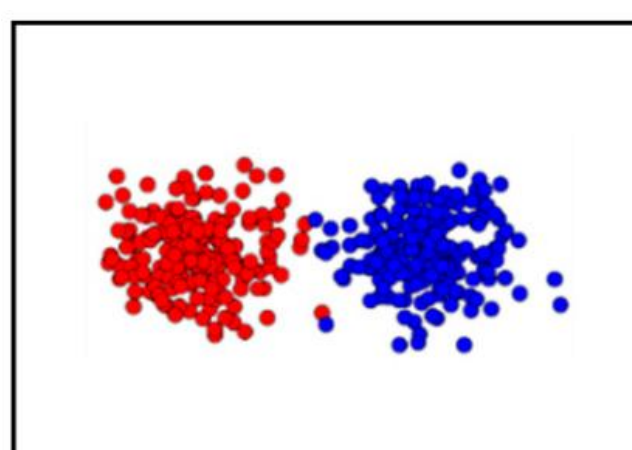
MOTIVATION

Limitation of Traditional Clustering Methods (eg. K-means, DBSCAN)

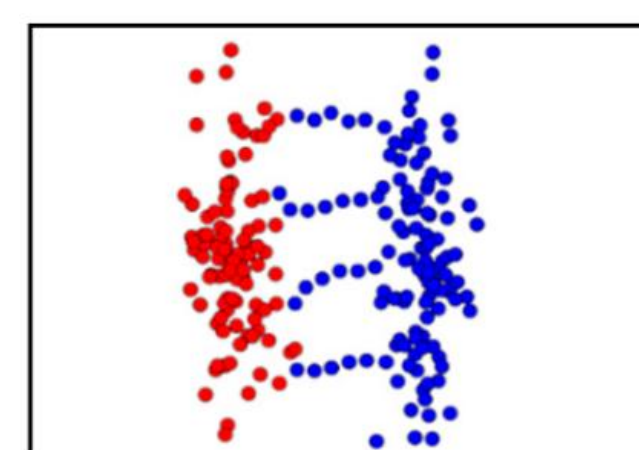
- Fail to handle datasets with different size, shape, density, and with noise, and outliers
- Fail to handle touching issue (multiple bridges, neck problem, adjacent problem)



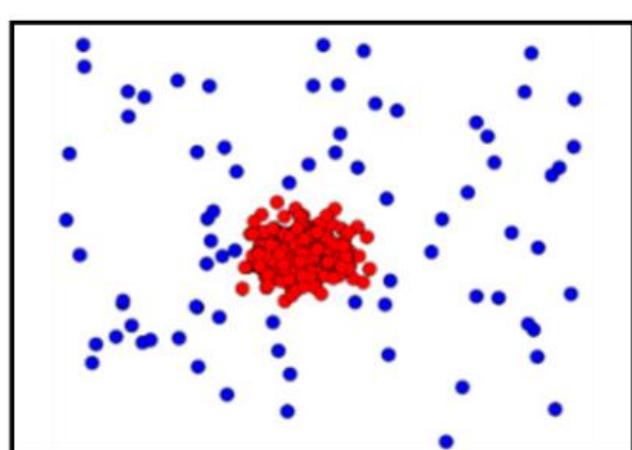
Adjacent problem



Neck problem



Chaining problem
(multiple bridges)



Various density

Limitation of Triangulation based clustering method (Kim J, Cho J. 2019)

- Incomplete algorithm
- Fail to handle nested clusters with different density distribution

METHODOLGY

Kernel Density Estimation (KDE) + Change Point Detection

- Starts with the point with highest density estimation and choose the direction with smallest step size at each time
- Splits data into initial clusters based on different density level

Delaunay Triangulation

- Rule: No vertex lies inside the circumcircle of any triangle in the set
- Better at connecting vertices to their neighbors so that proximity relationships were preserved

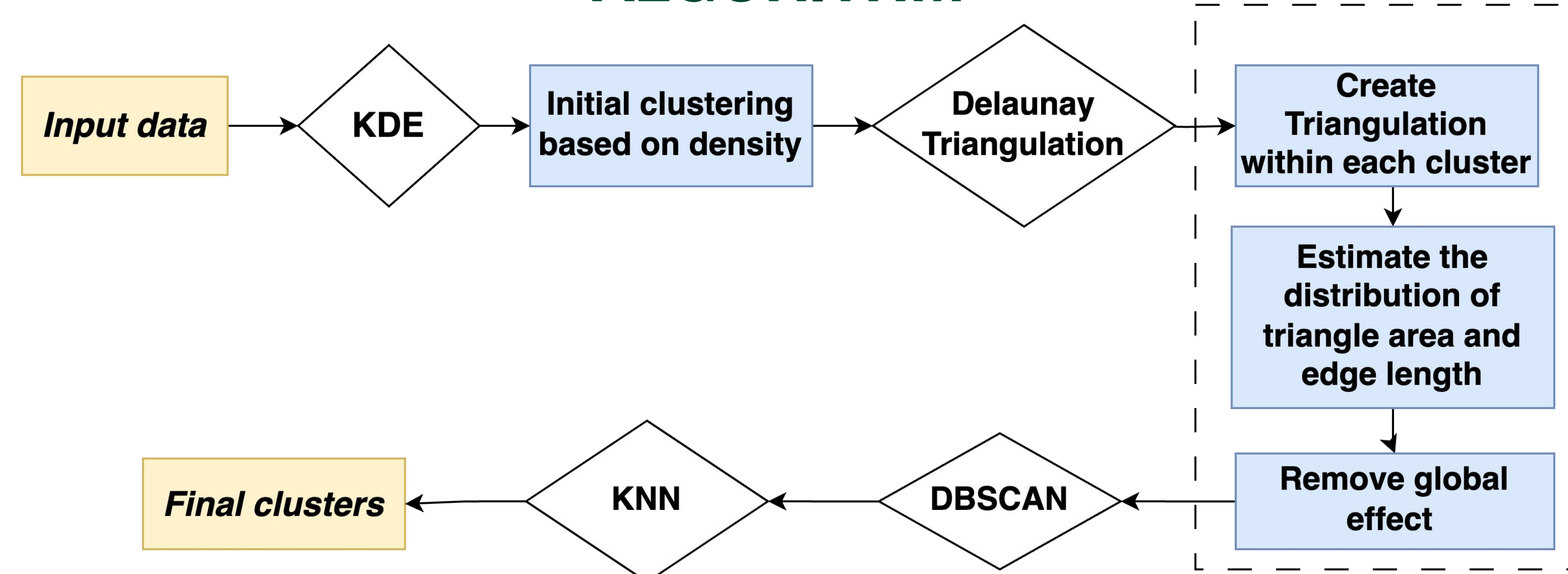
DBSCAN

- Density Based Spatial Clustering of Application with Noise
- Epsilon: radius of the circle **(was substituted by triangle's edges)**
- MinPoints: minimum number of points inside a circle
-> criteria for including a new point into a cluster

K-Nearest Neighbor (KNN)

- Solves boundary issue

ALGORITHM



EXPERIMENT

