Pacmann

Approximate Nearest Neighbor Algorithm

Final Advance ML Project - Sekolah Data Pacmann

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Outline

Pacmann

1. How ANN Works
2. ANN Limitations
3. Library ANN from Scratch

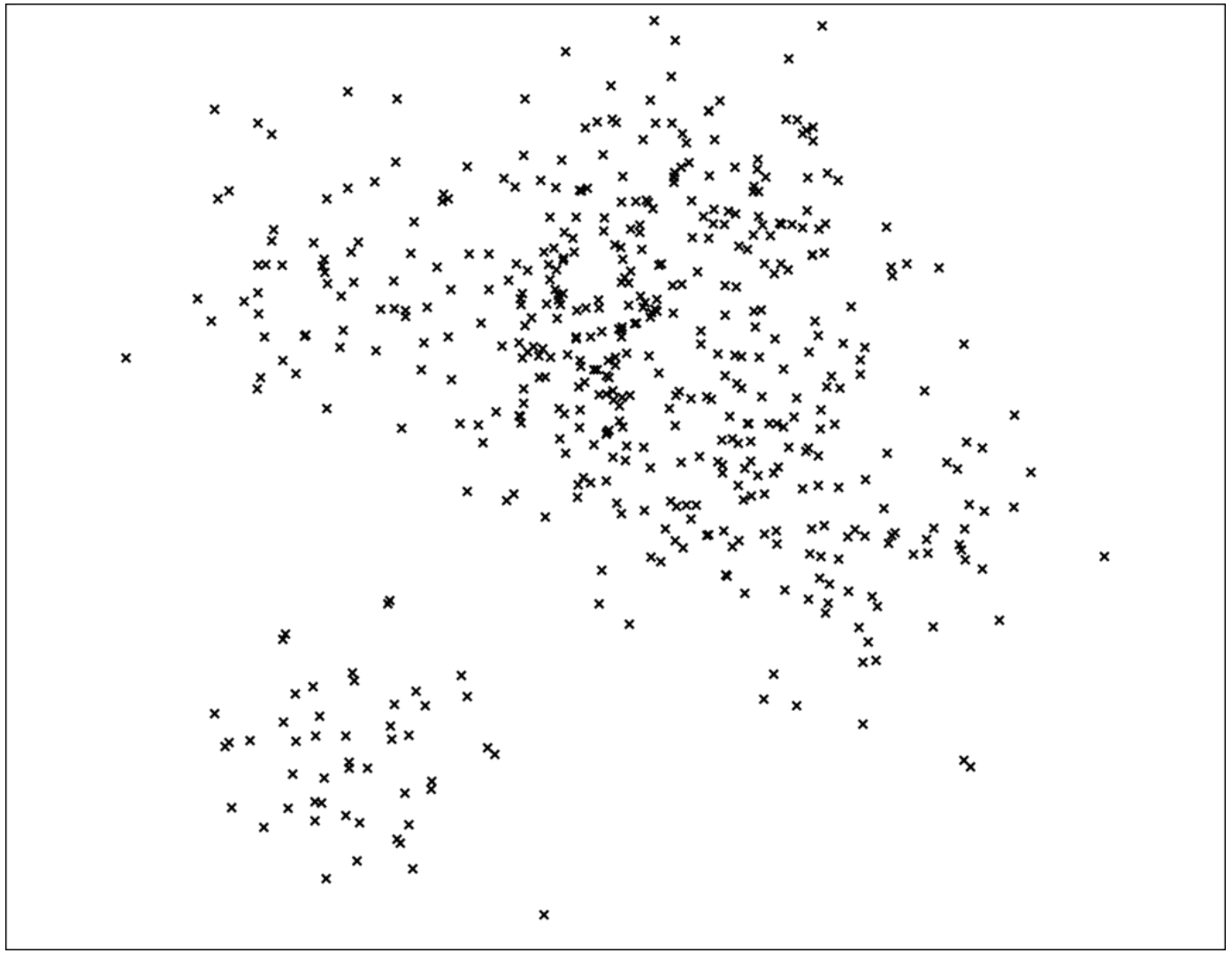
How ANN Works

How ANN Works

Pacmann

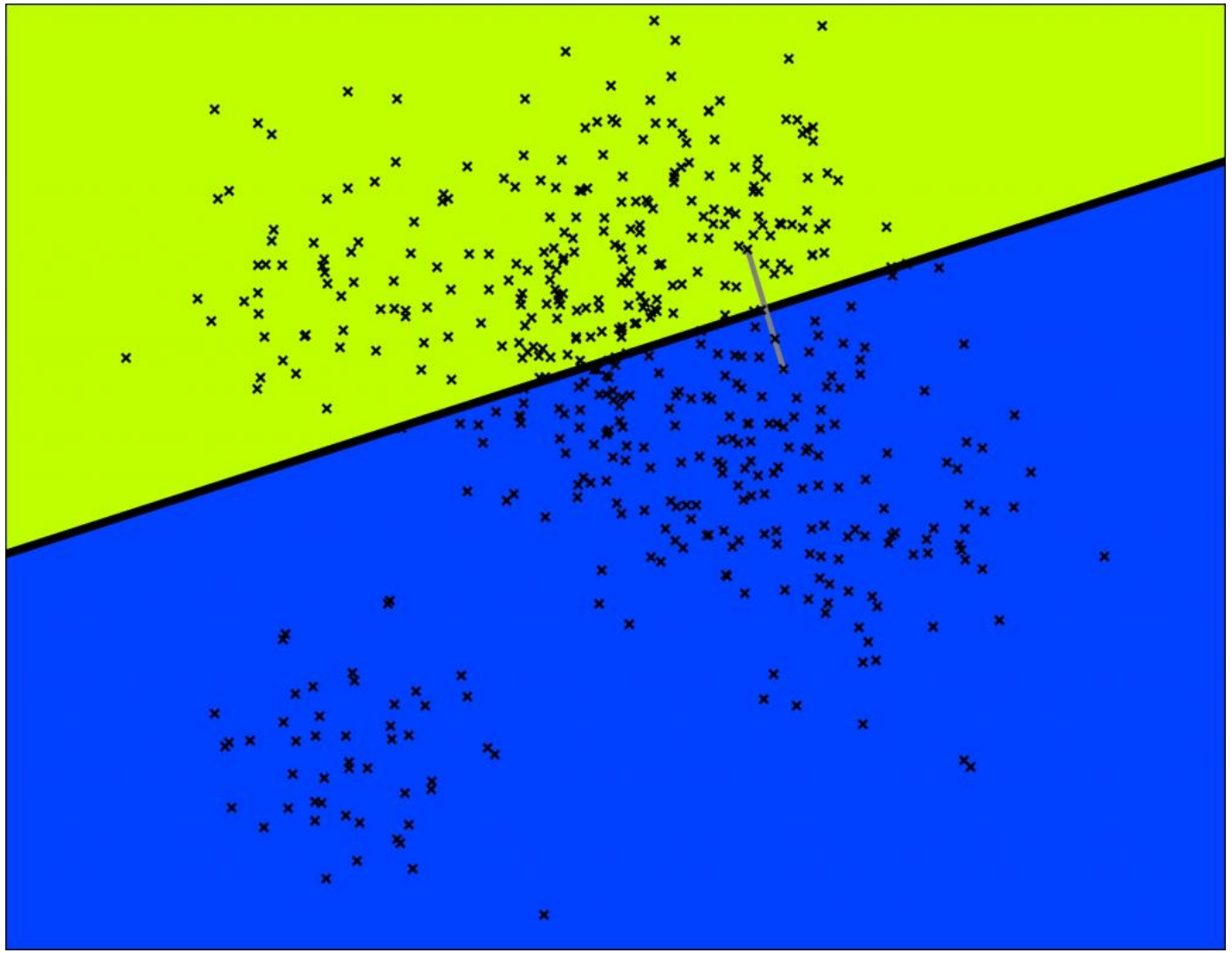
1. Random Cluster Data Training
2. Search Cluster Using Hyperplane
3. Calculate Distance Between Data Test and Leaf Node Data
4. Rank Result based on Distance

Random Cluster Data Training



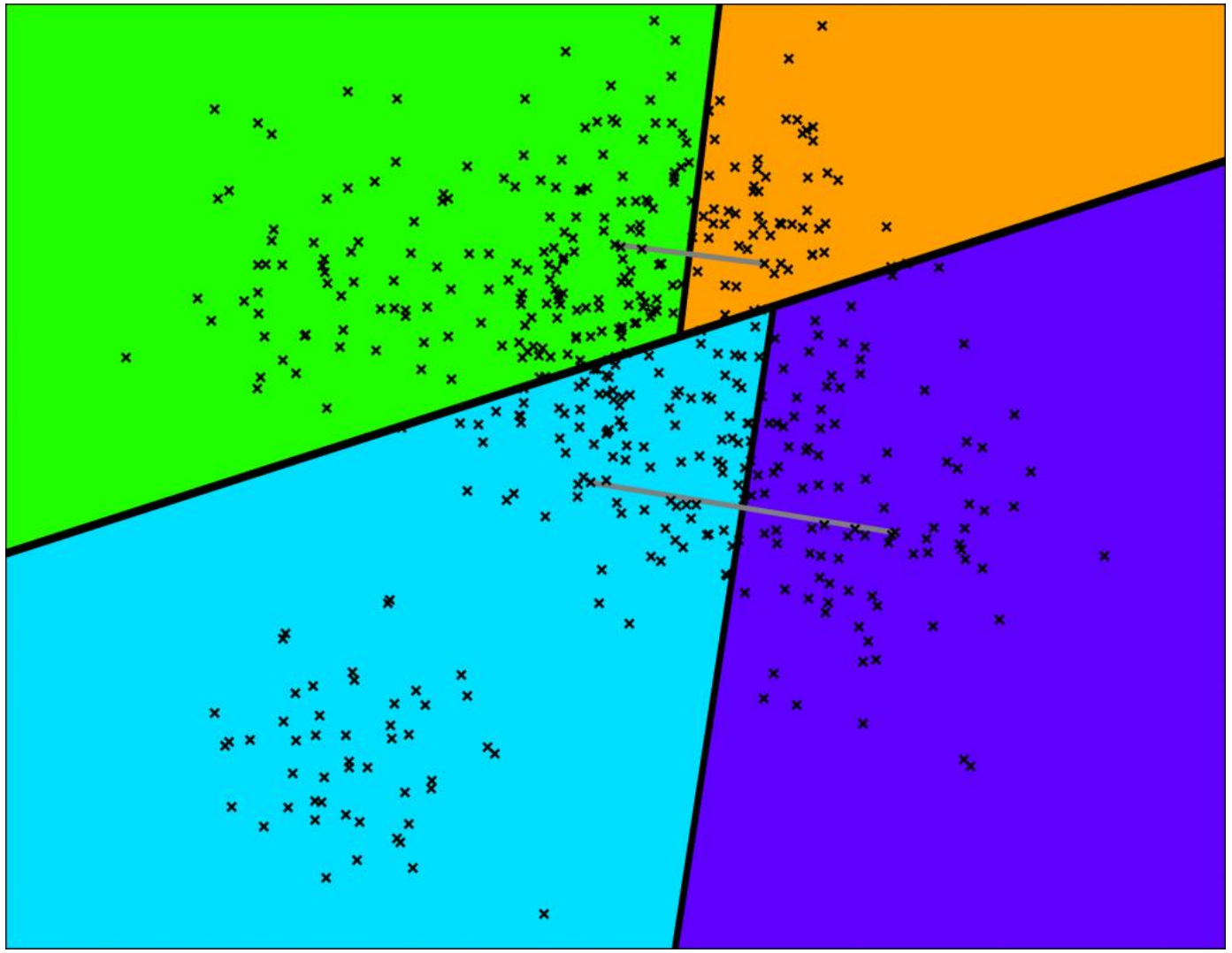
Source : erikbern.com

Random Cluster Data Training



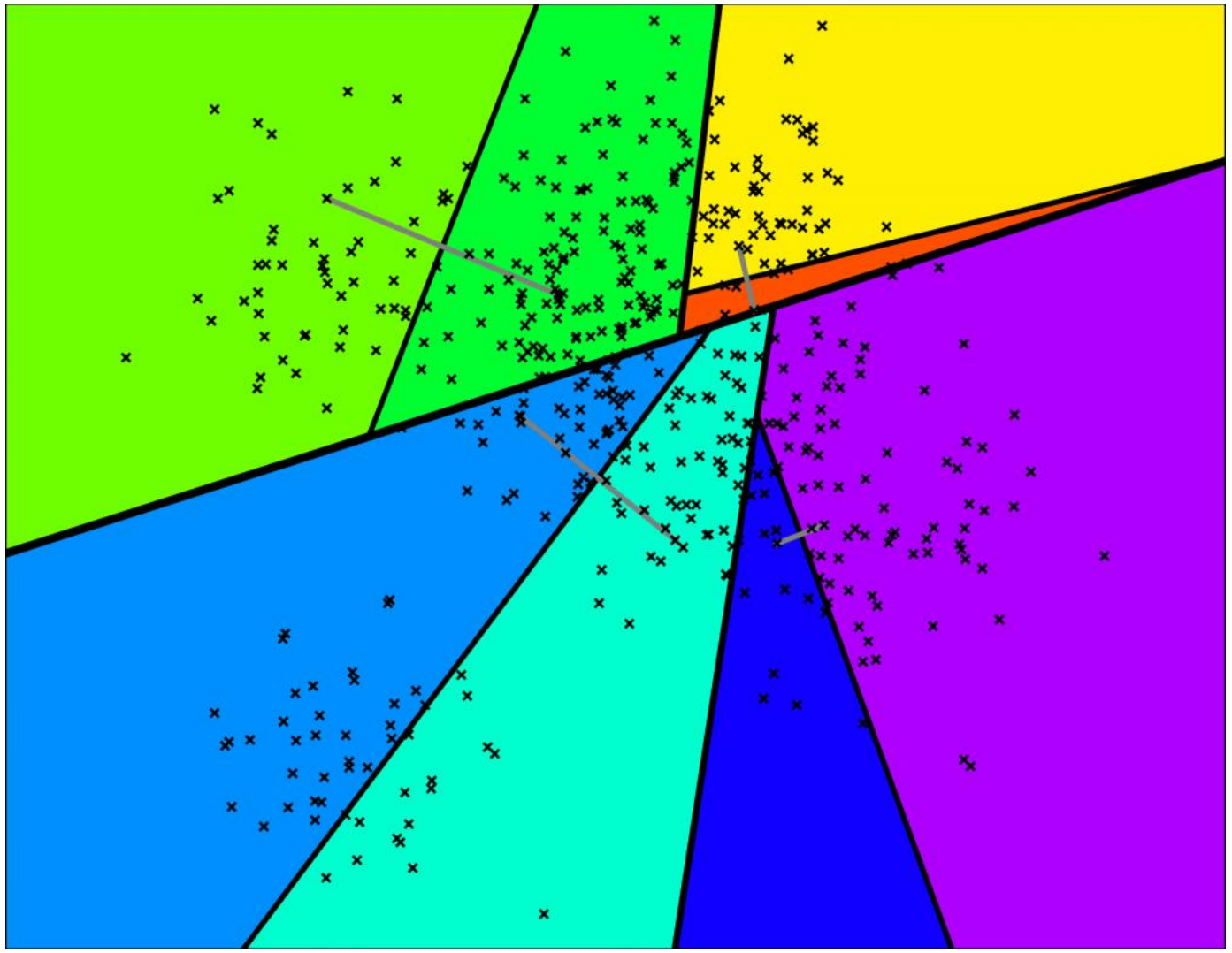
Source : erikbern.com

How ANN Works



Source : erikbern.com

Random Cluster Data Training



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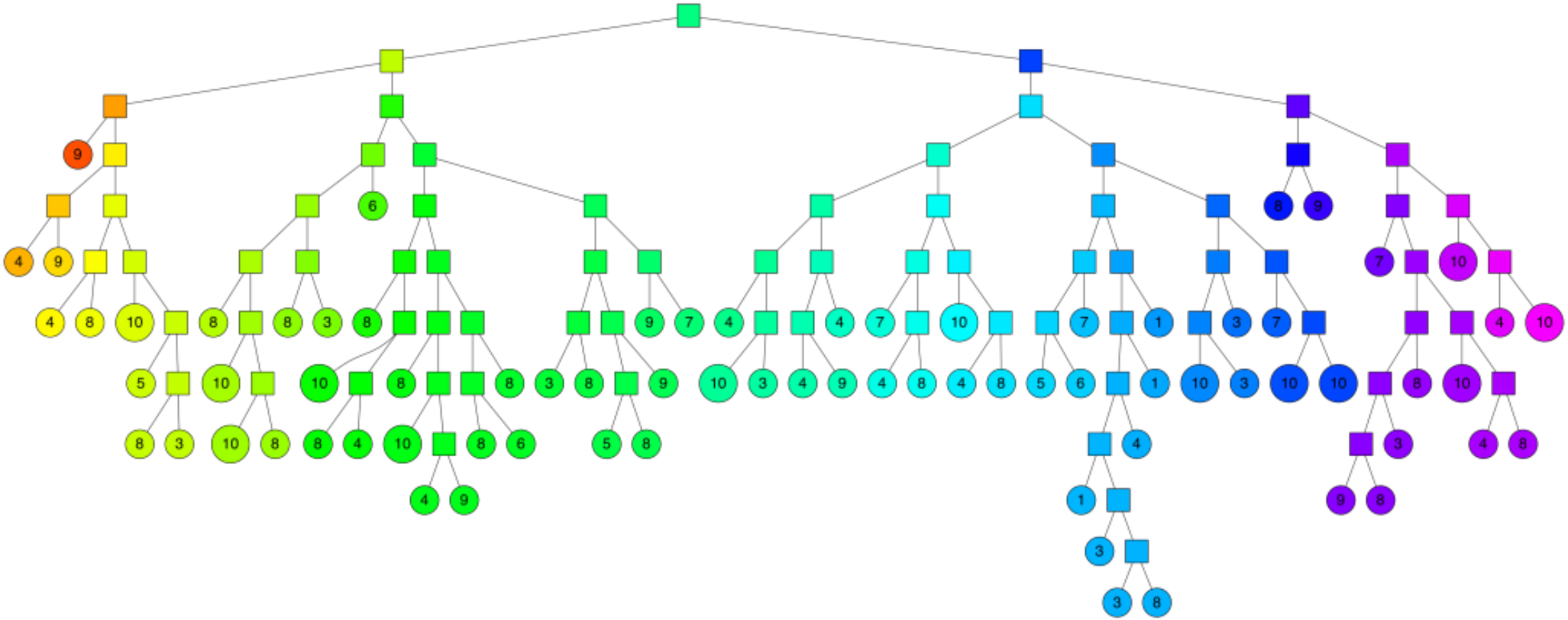
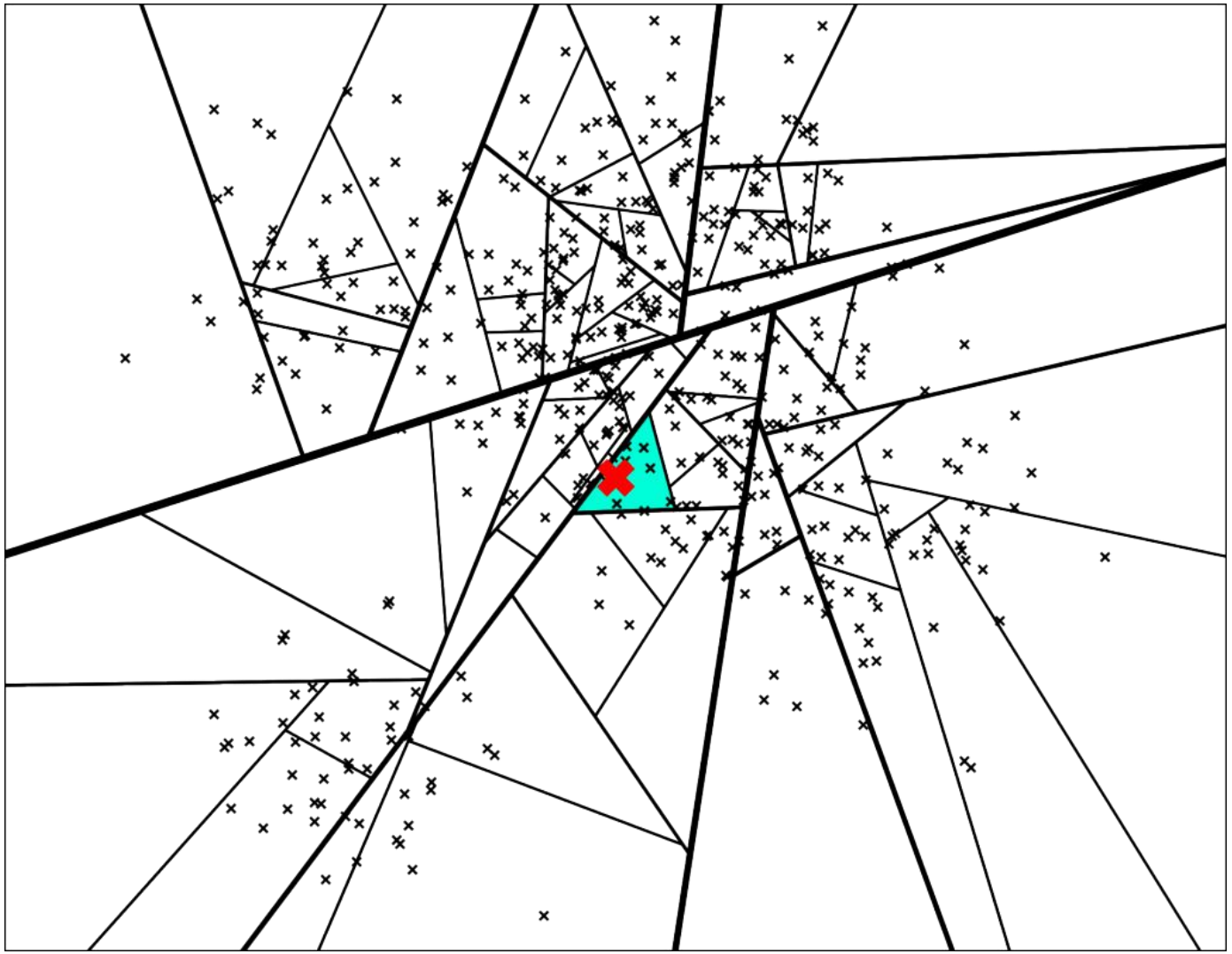
Random Cluster Data Training



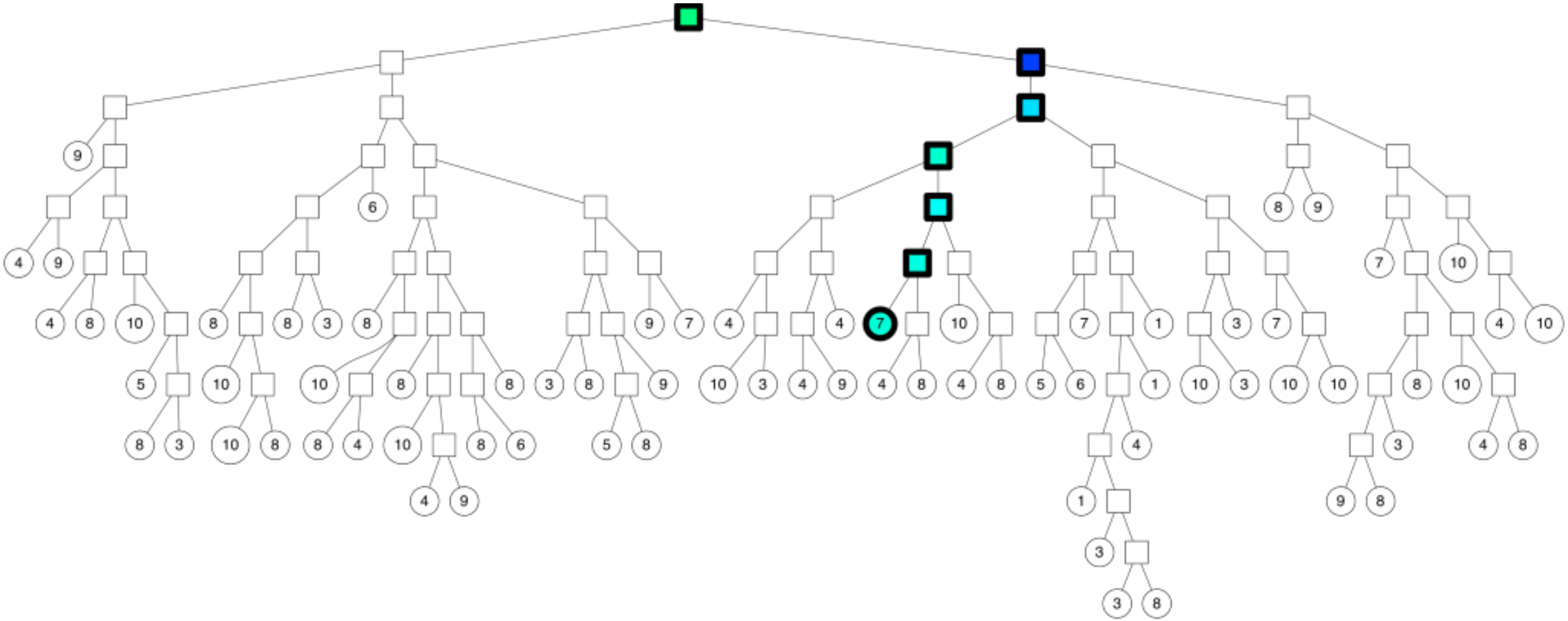
Source : erikbern.com

Search Cluster using Hyperplane



Source : erikbern.com

Search Cluster using Hyperplane



Source : erikbern.com

Calculate Distance Between Data Test and Leaf Node Data

Source : erikbern.com

Distance Calculation

1. Eucledian Distance
2. Cosine-Similarity
3. Manhattan Distance
4. Inner Product
5. etc

Rank Result based on Distance

Source : erikbern.com

Rank by Distance

1. Item 6
2. Item 4
3. Item 3
4. Item 7
5. .....

Eucledian Distance : Smallest to Largest

Cosine Similarity : Largest to Smallest

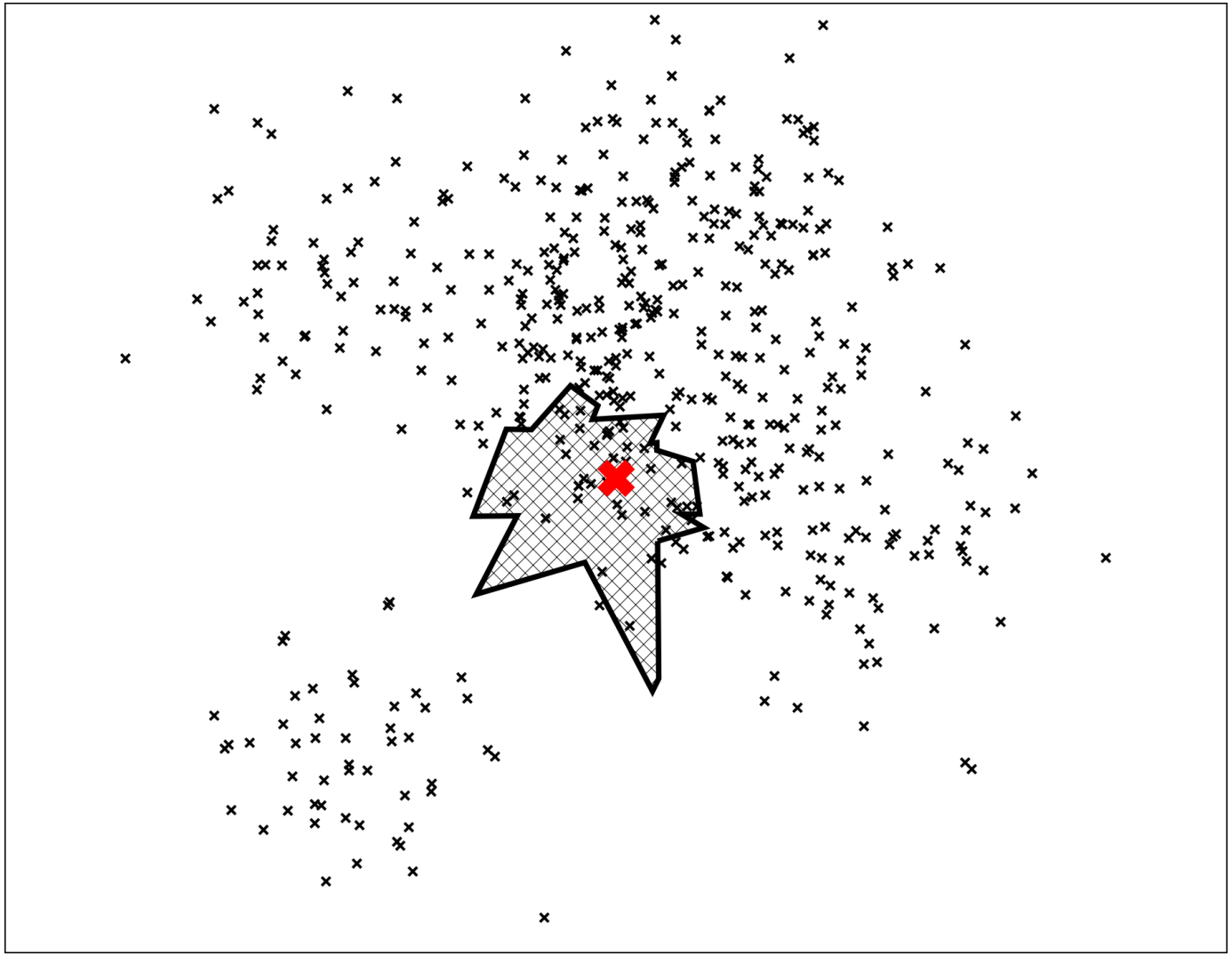
FINISH !!!!

ANN Limitations

ANN Limitations

Source : [erikbern.com]

ANN Limitations



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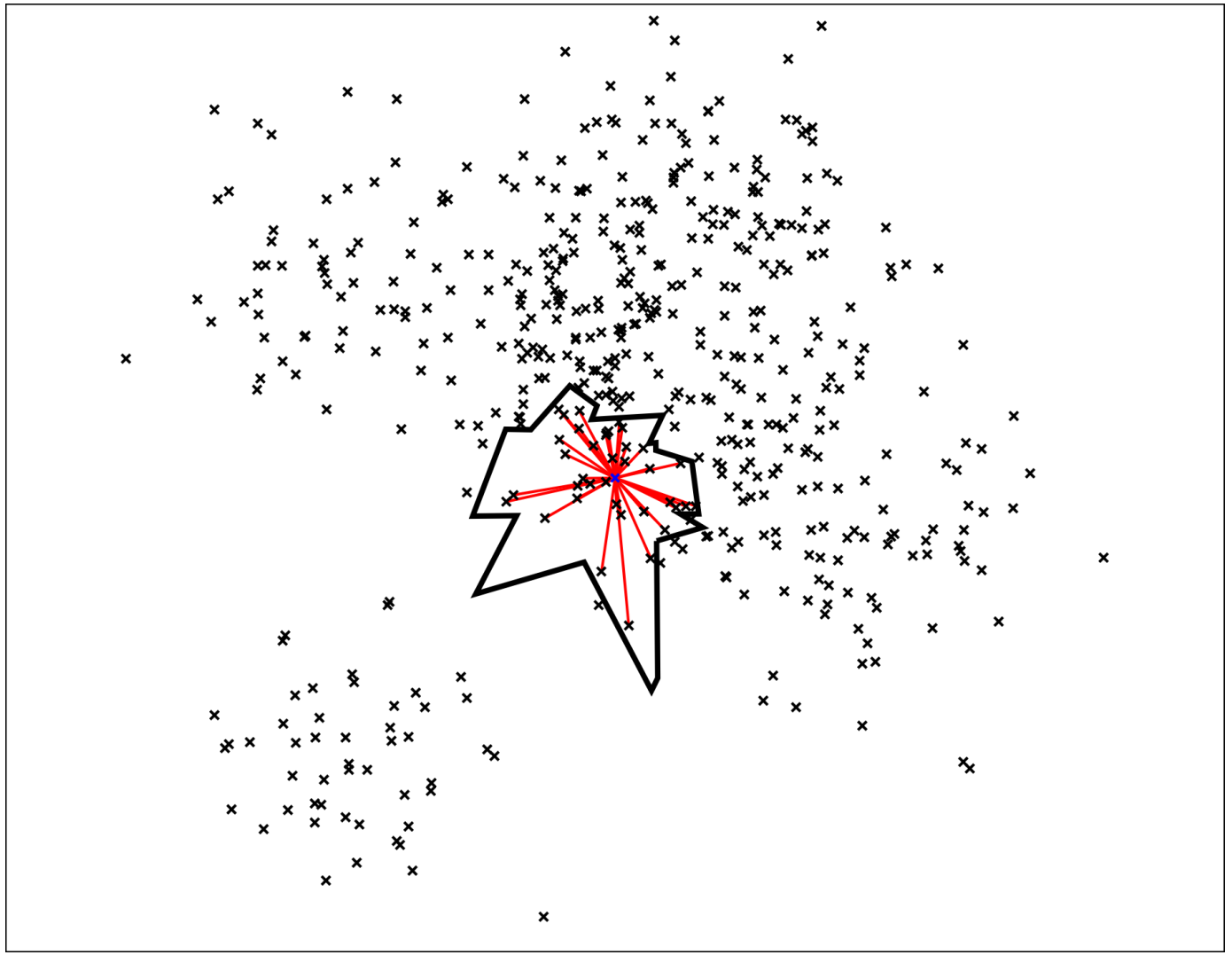
ANN Limitations



Source : erikbern.com

Library ANN From Scratch

ANN Library From Scratch

Pacmann

1. Class Node : store information about the node
2. Class ApproximateNearestNeighbors : create tree data structure and searching
3. Class KNearestNeighbors : brute force algorithm

Source Code :
https://github.com/stefanus-yudi-irwan/approximate-nearest-neighbor/blob/main/src/approximate_nn/approximate_nn.py

Comparison ANN and KNN

Reference

Annoy Developer Page : https://erikbern.com/2015/10/01/nearest-neighbors-and-vector-models-part-2-how-to-search-in-high-dimensional-spaces.html

Thank You