Non-linear dimension reduction techniques

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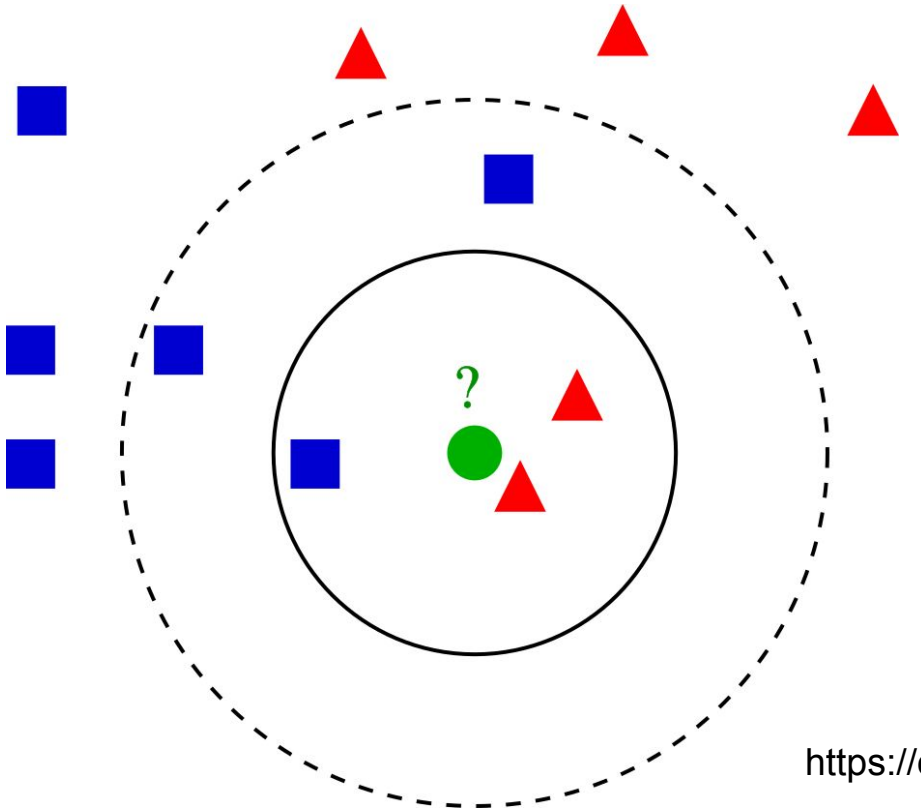
Overview

- SNN graph and clustering
- tSNE
- UMAP

SNN graph and clustering

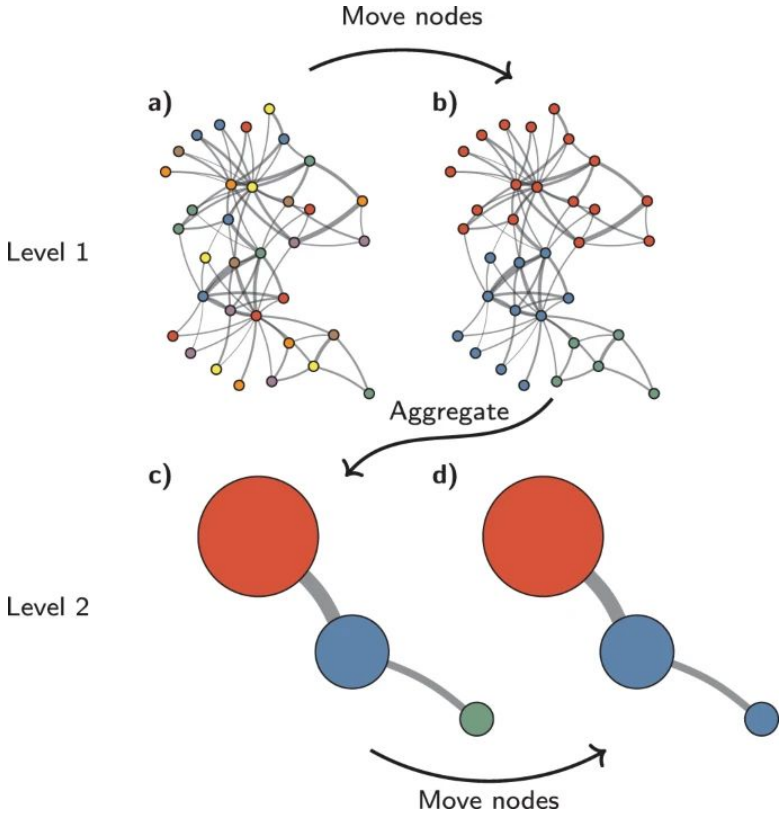
Shared nearest neighbour graph construction



1. find k nearest neighbours for each cell
2. calculate neighbourhood overlap (Jaccard index)
3. construct SNN graph

https://en.wikipedia.org/wiki/K-nearest_neighbors_algorithm

Louvain/Leiden clustering on the SNN graph

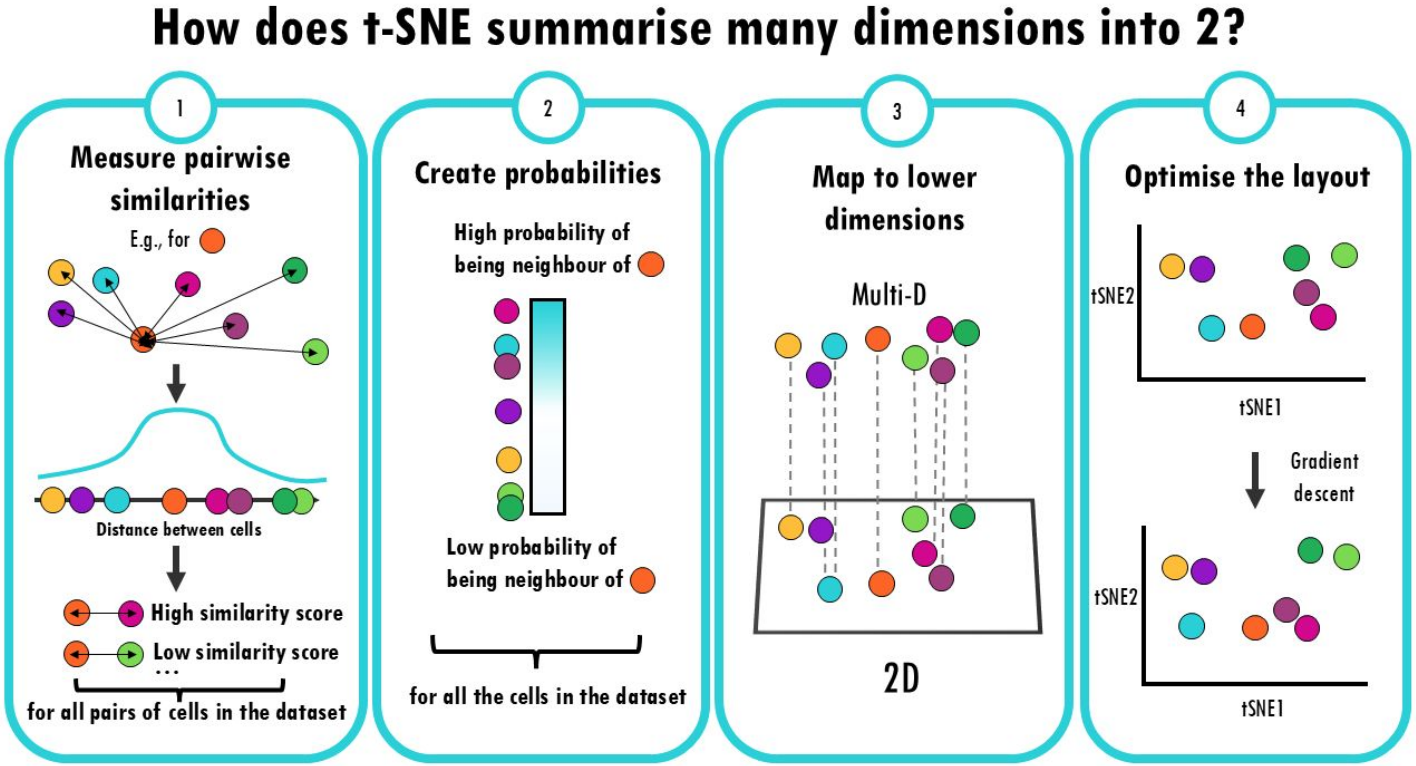


Resolution parameter:
Higher resolutions lead to more communities, while lower resolutions lead to fewer communities.

https://www.nature.com/articles/s41598-019-41695-z

tSNE

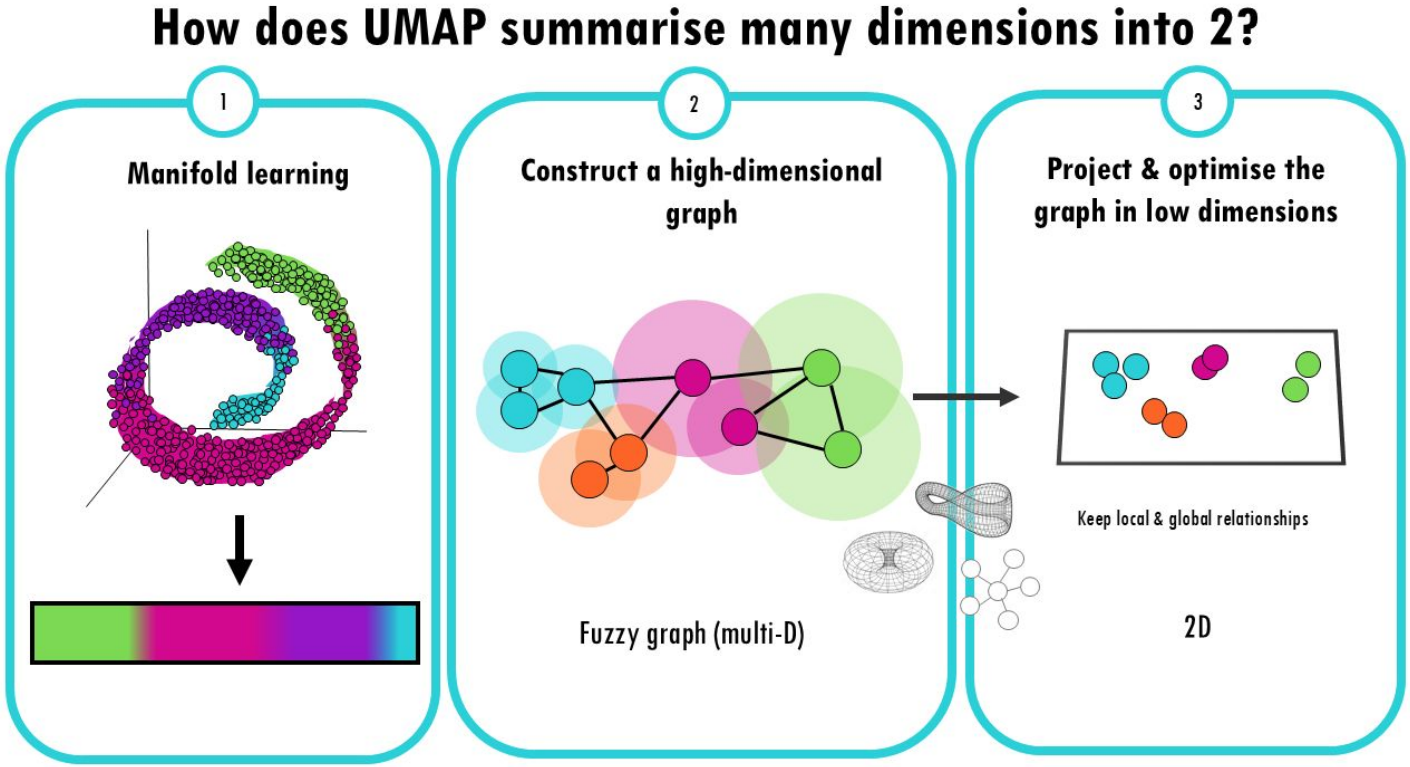
t-SNE



https://biostatsquid.com/easy-t-sne-explained-with-an-example/

UMAP

UMAP



https://biostatsquid.com/umap-simply-explained/