

t-SNE

t-distributed Stochastic Neighbor Embedding

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Primary purpose is for visualizing high parameter data

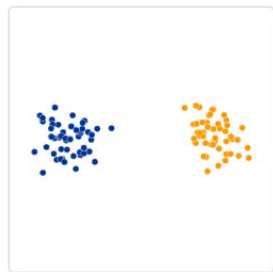
It is a form of non-linear dimensionality reduction

Pro: Retains both global and local data structure

Con: Computationally expensive

Con: Data point crowding in 2 dimensional space, sometimes may require clustering algorithm to see fine-grained boundaries between populations

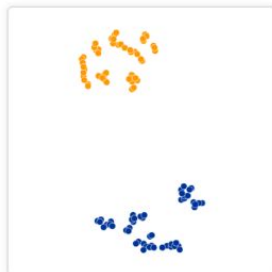
Perplexity



Original



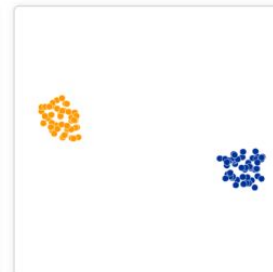
Perplexity: 2
Step: 5,000



Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000



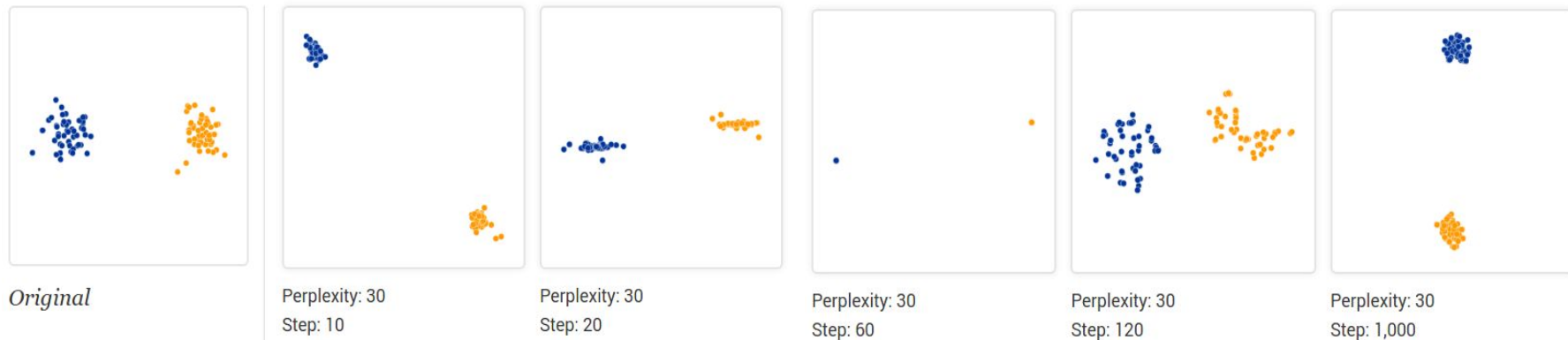
Perplexity: 50
Step: 5,000



Perplexity: 100
Step: 5,000

t-SNE has a perplexity variable which is how much you vary the attention between global and local aspects of your data

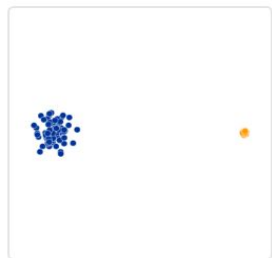
Training



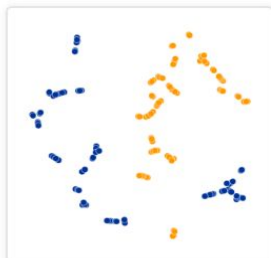
t-SNE has an epsilon which is described by a learning rate, or how much it learns from each iteration

You can also stop it before it becomes stable

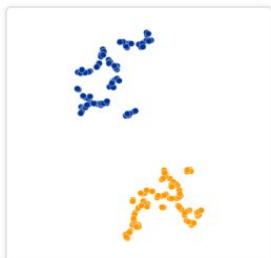
Cluster sizes mean nothing.



Original



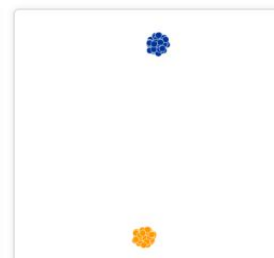
Perplexity: 2
Step: 5,000



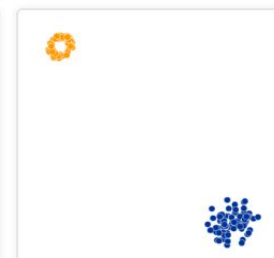
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000



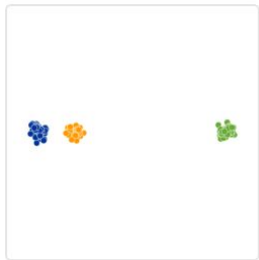
Perplexity: 50
Step: 5,000



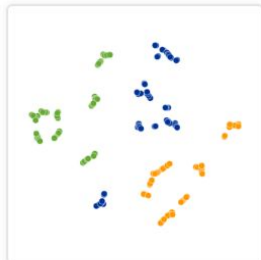
Perplexity: 100
Step: 5,000

Distances between clusters might not mean anything

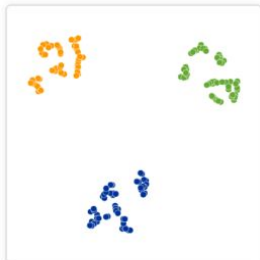
Fewer Points



Original



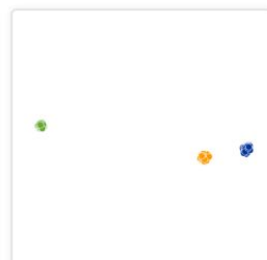
Perplexity: 2
Step: 5,000



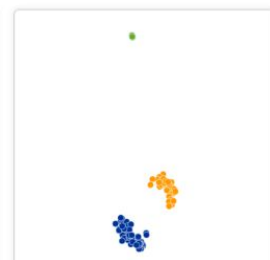
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000



Perplexity: 50
Step: 5,000

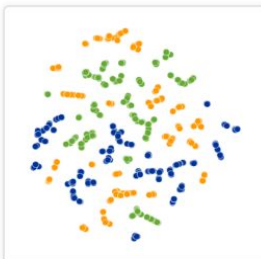


Perplexity: 100
Step: 5,000

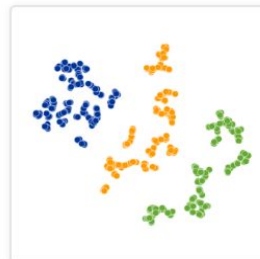
More Points



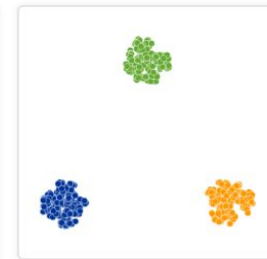
Original



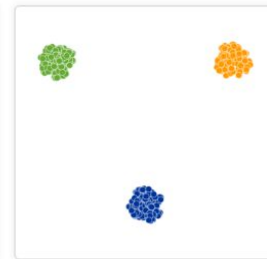
Perplexity: 2
Step: 5,000



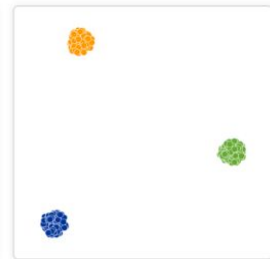
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000

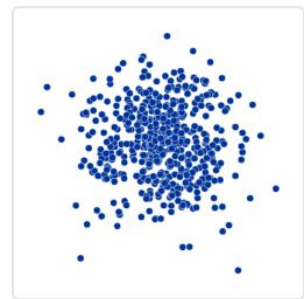


Perplexity: 50
Step: 5,000

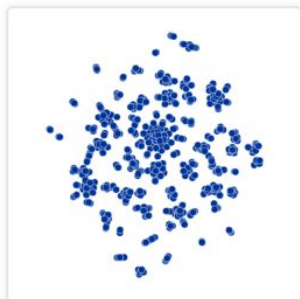


Perplexity: 100
Step: 5,000

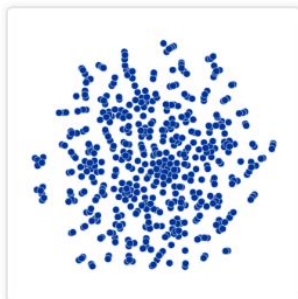
Shapes and patterns can be seen in noise:



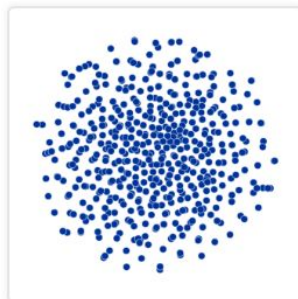
Original



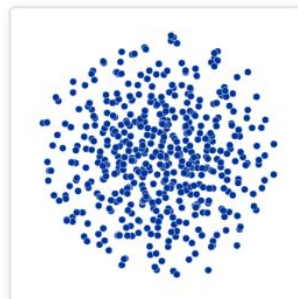
Perplexity: 2
Step: 5,000



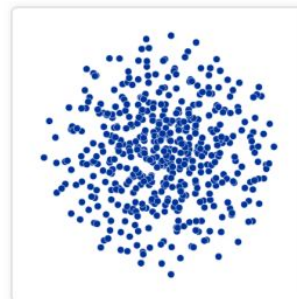
Perplexity: 5
Step: 5,000



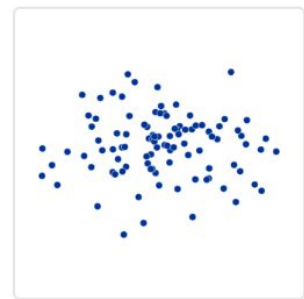
Perplexity: 30
Step: 5,000



Perplexity: 50
Step: 5,000



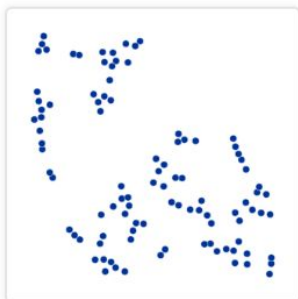
Perplexity: 100
Step: 5,000



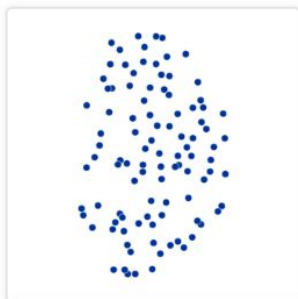
Original



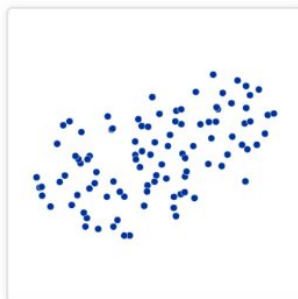
Perplexity: 2
Step: 5,000



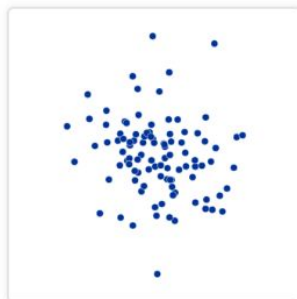
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000

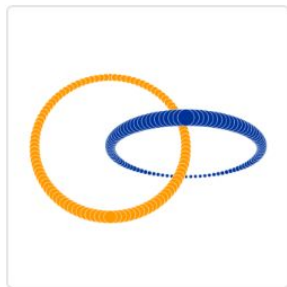


Perplexity: 50
Step: 5,000

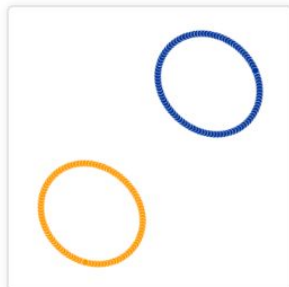


Perplexity: 100
Step: 5,000

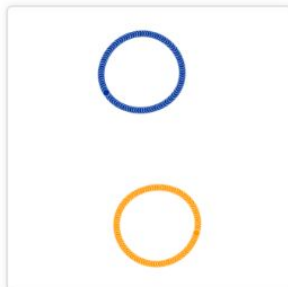
Multi-dimensional data



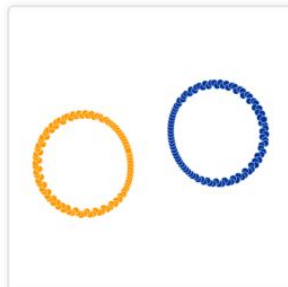
Original



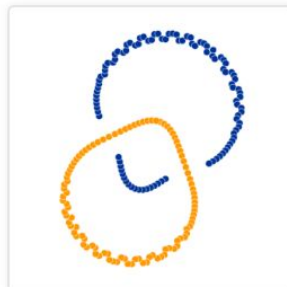
Perplexity: 2
Step: 5,000



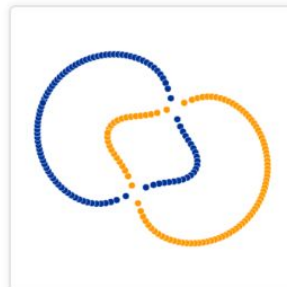
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000



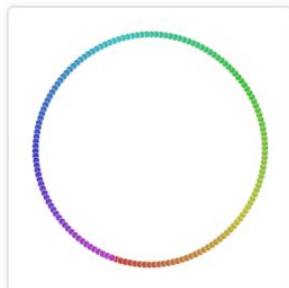
Perplexity: 50
Step: 5,000



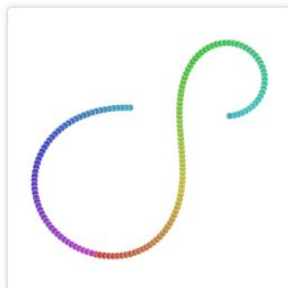
Perplexity: 100
Step: 5,000



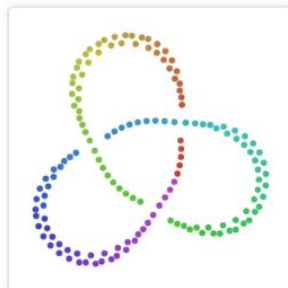
Original



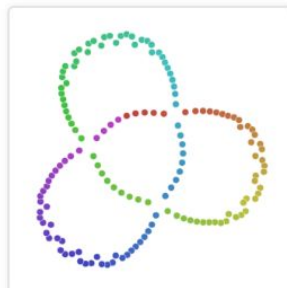
Perplexity: 2
Step: 5,000



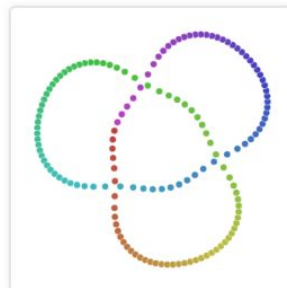
Perplexity: 5
Step: 5,000



Perplexity: 30
Step: 5,000



Perplexity: 50
Step: 5,000



Perplexity: 100
Step: 5,000

Word2Vec Visualization

