

The code is designed to visualize embeddings of sentences in 2D and 3D using t-SNE (t-distributed stochastic neighbor embedding). t-SNE is a dimensionality reduction technique that is particularly well-suited for visualizing high-dimensional data in a lower-dimensional space. In this code, t-SNE is used to reduce the dimensionality of sentence embeddings and plot them in 2D and 3D space.

Here is a breakdown of the code:

## Importing modules

The code starts by importing the necessary modules, including:

`random`

`os`

`matplotlib.pyplot as plt`

`tsnecuda.TSNE`

## Preparing the embeddings

The code initializes a list called "embeddings" which contains the sentence embeddings. The embeddings are extracted from a larger dataset of embeddings.

## 2D visualizations

The code then applies t-SNE with 2 components to the embeddings to reduce the dimensionality to 2. This is done using the "TSNE" function from the "tsnecuda" module.

The resulting 2D embeddings are plotted using the "scatter" function from matplotlib. The points are made translucent with "alpha=.1" so that regions with high density of overlapping points can be visually identified.

## 3D visualizations

The code also provides 3D visualizations of the embeddings.

First, the embeddings are again reduced to 3 dimensions using t-SNE with the "TSNE" function from the "tsnecuda" module.

The resulting 3D embeddings are plotted using the "scatter" function from matplotlib with "projection='3d'" to specify the plot is in 3D. The points are made translucent with "alpha=.1" to visually identify regions with high density of overlapping points.

Overall, this code can be used to visualize sentence embeddings in 2D and 3D space using t-SNE. The resulting visualizations can help identify patterns and similarities in the embeddings.