0.1 FaceNet

System that directly learns a mapping from face images to a compact Euclidean space where distances correspond to a measure of face similarities.

Performs face recognition, verification and clustering with standard techniques with Facenet embeddings as feature vectors.

Solves the problem of illumination and pose

This article has proofs that what distinguishes a face recognition method from a verification method is the treatment of the output.

- Dimensionality - number of input variables or features for a dataset. This Article (https://www.sciencedirect.com/science/article/abs/pii/0031320390900089) also defines it as the number of connections (i.e weights) and number of input units.

- Embeddings - In general, embedding is the mapping of a discrete/categorical variable to a vector of continuous numbers. Neural network embeddings are a low-dimensional space into which high-dimension categorical/discrete vectors can be translated to. Neural networks embeddings are low dimensional, learned continuous vector representations of discrete variables. It places similar inputs close together in the embedding space. They reduce the dimensionality of categorical variables and solve the one hot encoding limitations (each category has a one hot encoding, therefore, high dimensionality; it doesn't place similar entities closer to another in the vector space; and the main issue is that the transformation does not rely on any supervisions). The embeddings are learned through supervised training and form the weights of the network, which are adjusted to minimize the loss on the task.

Bottleneck layer - layer with less nodes than the previous one. It's used to reduce the dimensionality of the feature maps in the case of the CNN or the input features in general.