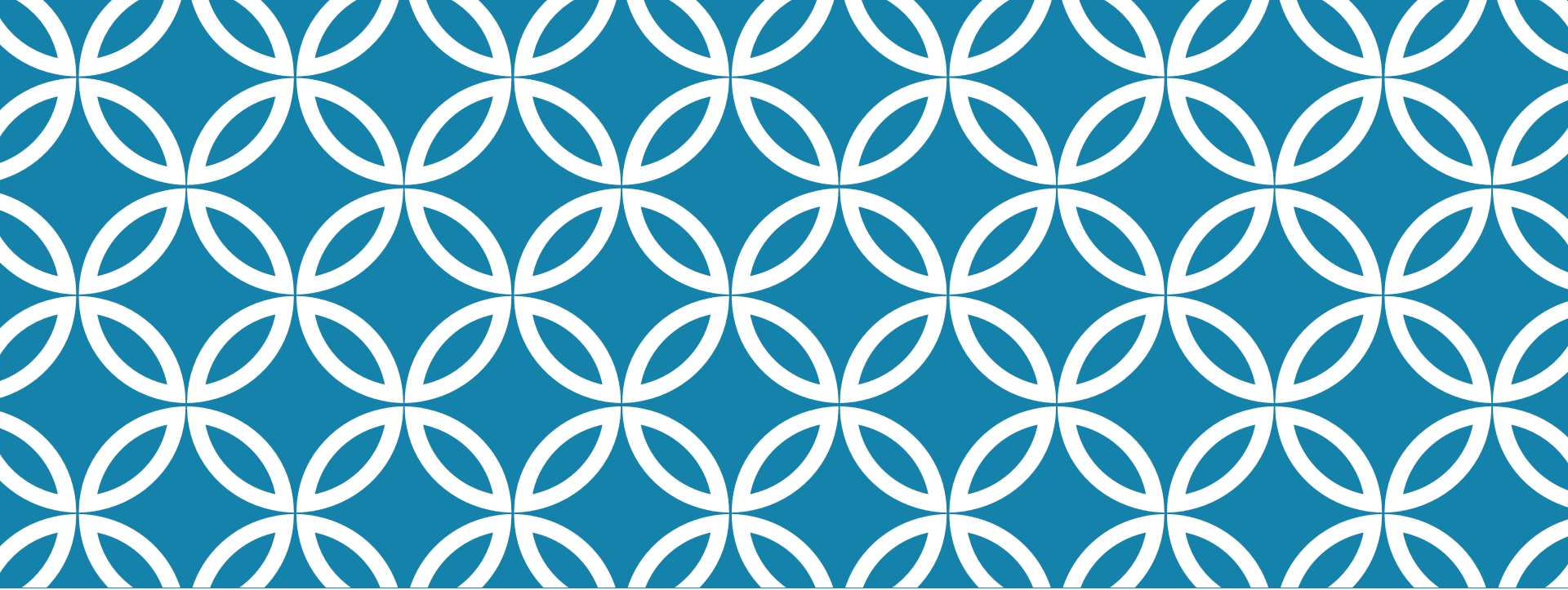


zalando

IST 707 – FINAL PROJECT

Bhavani Shankar
Jordan Cheong
Nidhi Shetty
Sagarika Naik

THE iSCHOOL
Syracuse University

What is zalando?

- Zalando SE is a German e-commerce company based in Berlin
- Cross-platform online store that sells shoes, fashion and beauty items

zalando

The Dataset

Zalando's article images - consisting of a training set of 60,000 examples and a test set of 10,000 examples

Each example is a 28x28 grayscale image, associated with a label from 10 classes

Shares the same image size and structure of training and testing splits as MNIST

https://github.com/zalandoresearch/fashion-mnist/raw/master/doc/img/fashion-mnist-sprite.png

Labels

Label	Description
0	T-shirt/top
1	Trouser
2	Pullover
3	Dress
4	Coat
5	Sandal
6	Shirt
7	Sneaker
8	Bag
9	Ankle boot

T-SNE

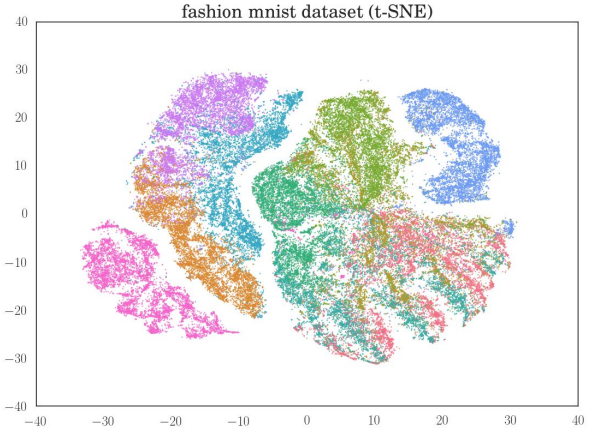
- t-Distributed Stochastic Neighbor Embedding (t-SNE) is a (prize-winning) technique for dimensionality reduction that is particularly well suited for the visualization of high-dimensional datasets.

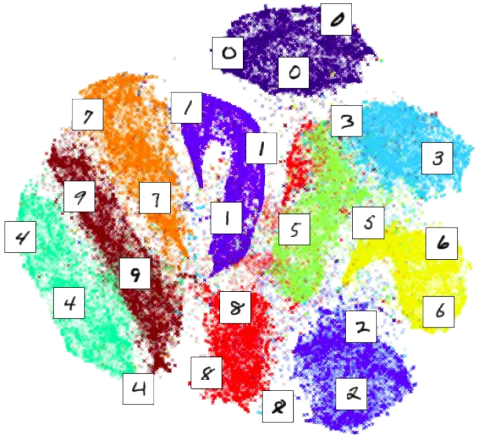
- The technique can be implemented via Barnes-Hut approximations, allowing it to be applied on large real-world datasets.

PCA

- Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables (entities each of which takes on various numerical values) into a set of values of linearly uncorrelated variables called principal components.

MNIST VS FASHION MNIST (T-SNE)





PCA: https://goo.gl/PP3qw6

T-SNE: https://goo.gl/kK5FLM

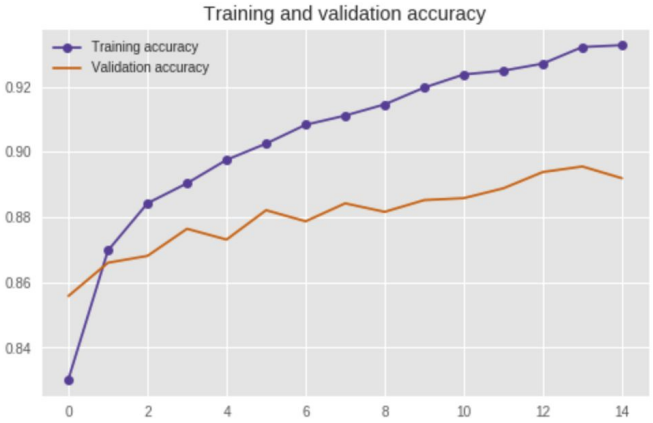
Keras and Sequential Model

- Keras is an open source neural network library written in Python.
- Keras contains numerous implementations of commonly used neural network building blocks such as layers,objectives, activation functions, optimizers and a host of tools to make working with image and text data easier.
- Sequential model is a linear stack of layers.

Preliminary Results (Sequential Model)

Sequential model 2 Dense layers ReLU and Softmax, Compiled using Adam

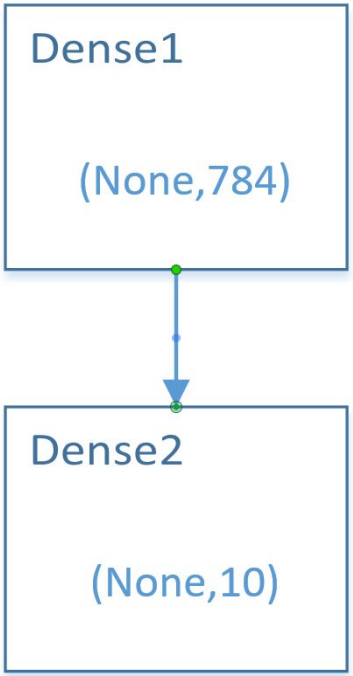
- Baseline Error: 12.11%
- Accuracy: 87.89%

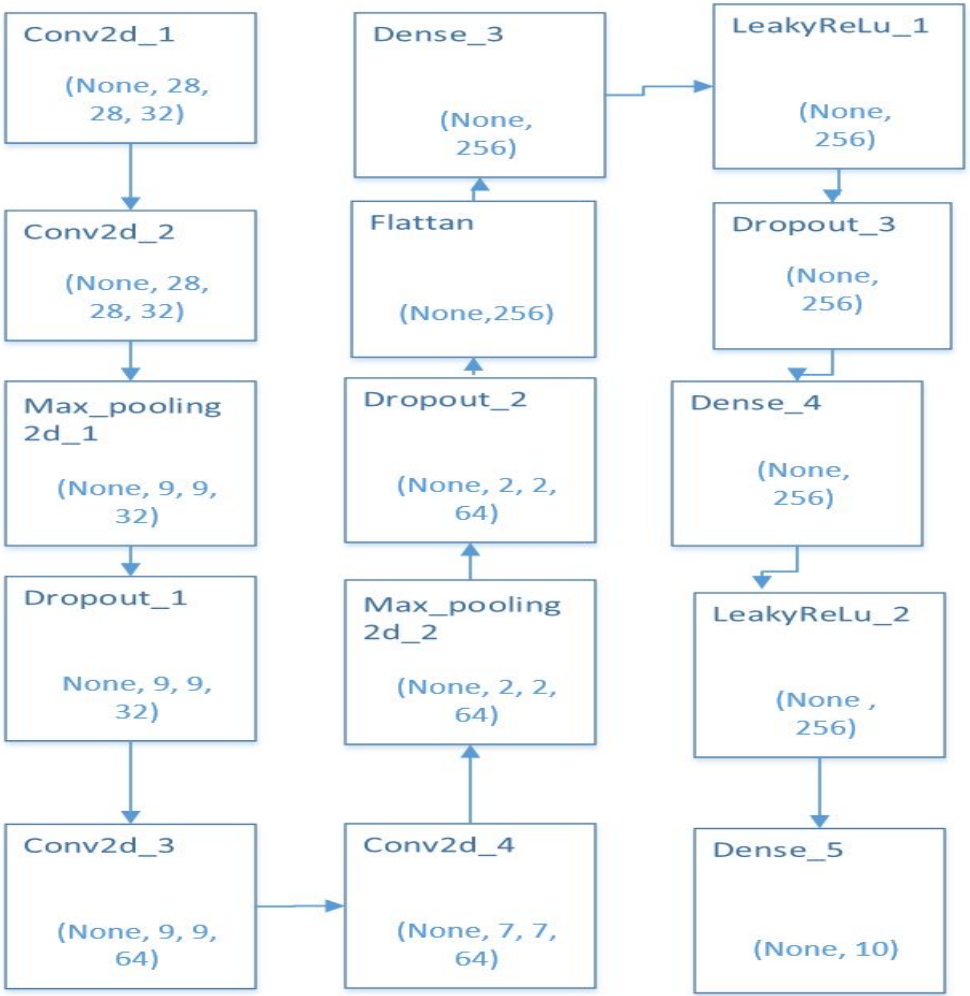


VGG Neural Network

- It is a deep convolutional network for object recognition developed and trained by Oxford's renowned Visual Geometry Group (VGG), which achieved very good performance on the ImageNet dataset.

- Taking inspiration from the paper, we developed our network


Dense1
(None,784)
Dense2
(None,10)


Conv2d_1
(None, 28, 28, 32)
Conv2d_2
(None, 28, 28, 32)
Max_pooling 2d_1
(None, 9, 9, 32)
Dropout_1
None, 9, 9, 32)
Conv2d_3
(None, 9, 9, 64)
Conv2d_4
(None, 7, 7, 64)
Max_pooling 2d_2
(None, 2, 2, 64)
Dropout_2
(None, 2, 2, 64)
Flattan
(None,256)
Dense_3
(None, 256)
LeakyReLu_1
(None, 256)
Dropout_3
(None, 256)
Dense_4
(None, 256)
LeakyReLu_2
(None , 256)
Dense_5
(None, 10)