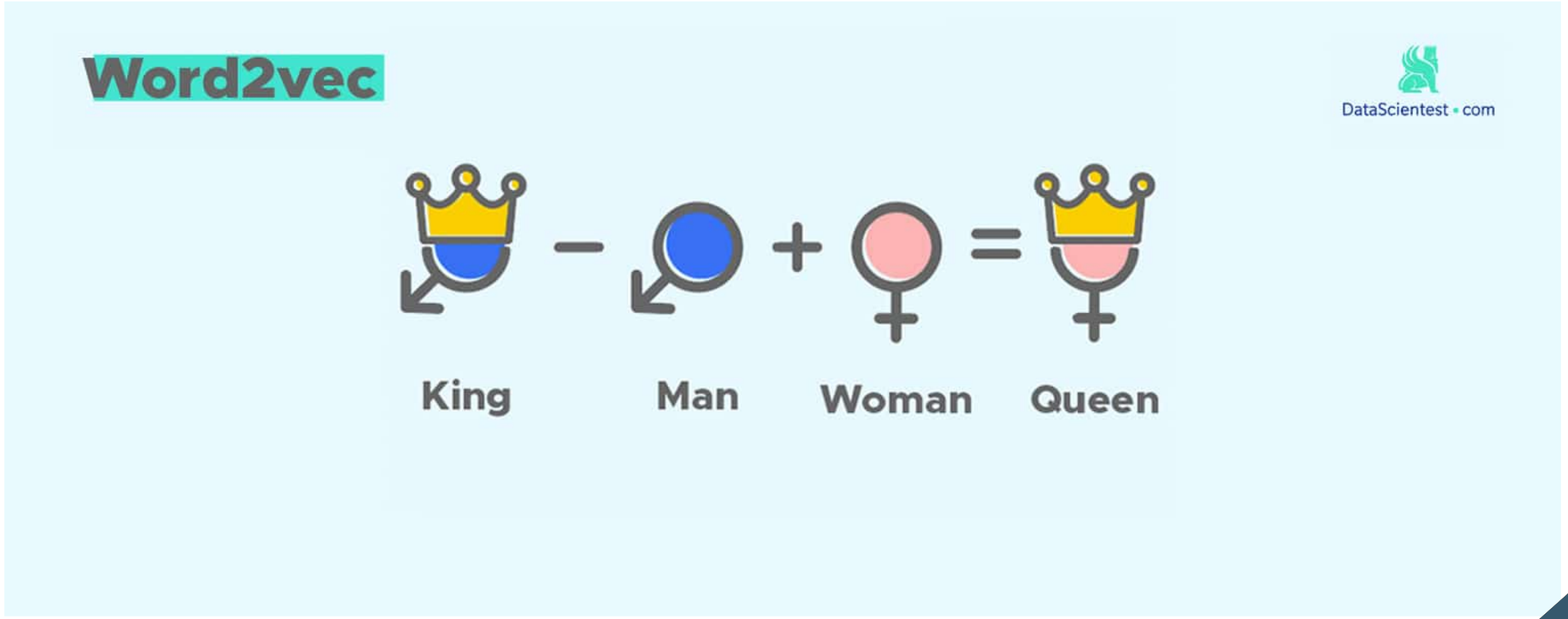
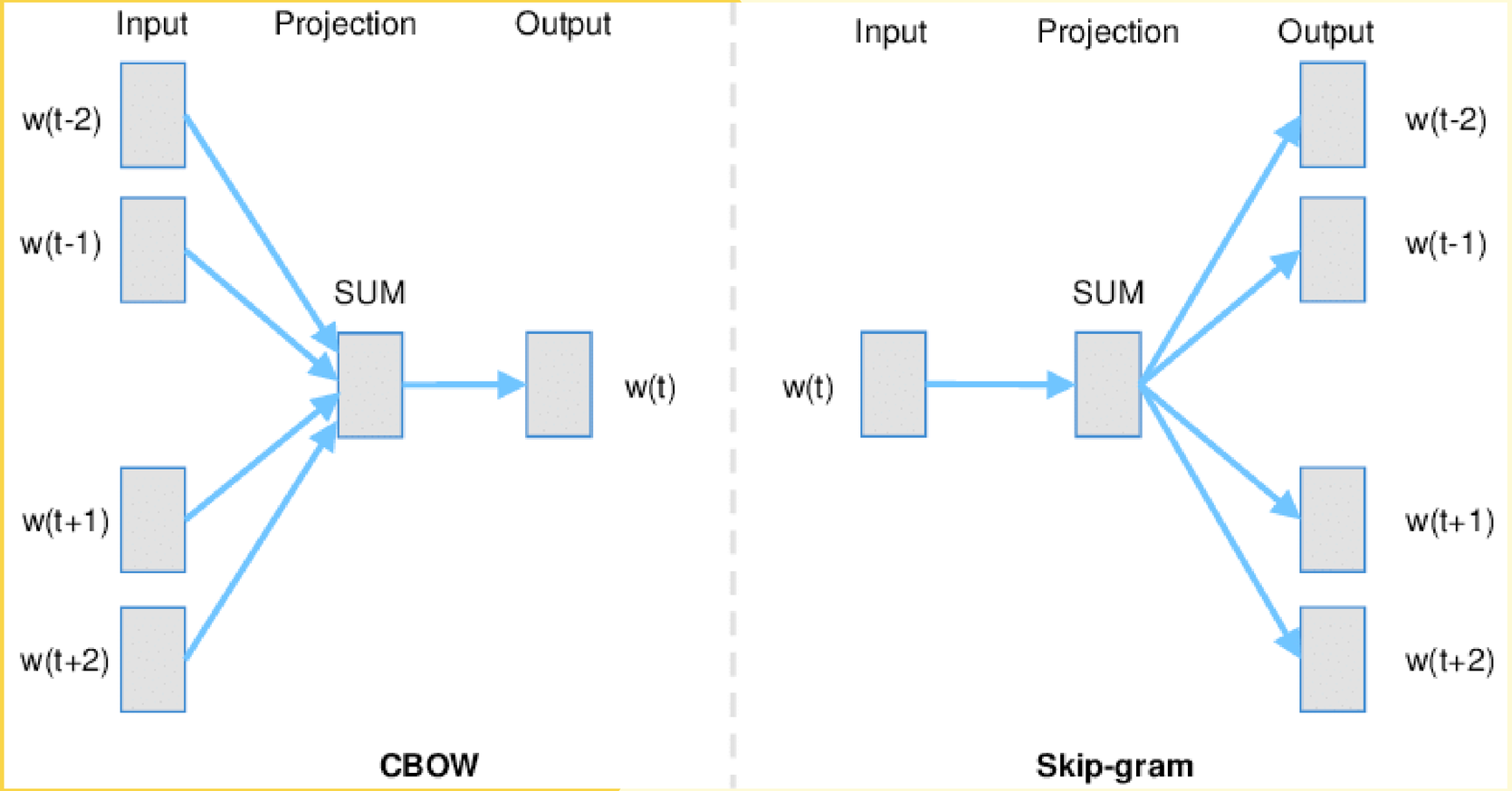
Bilgisayar Mühendisliğinde Özel Konular Projesi

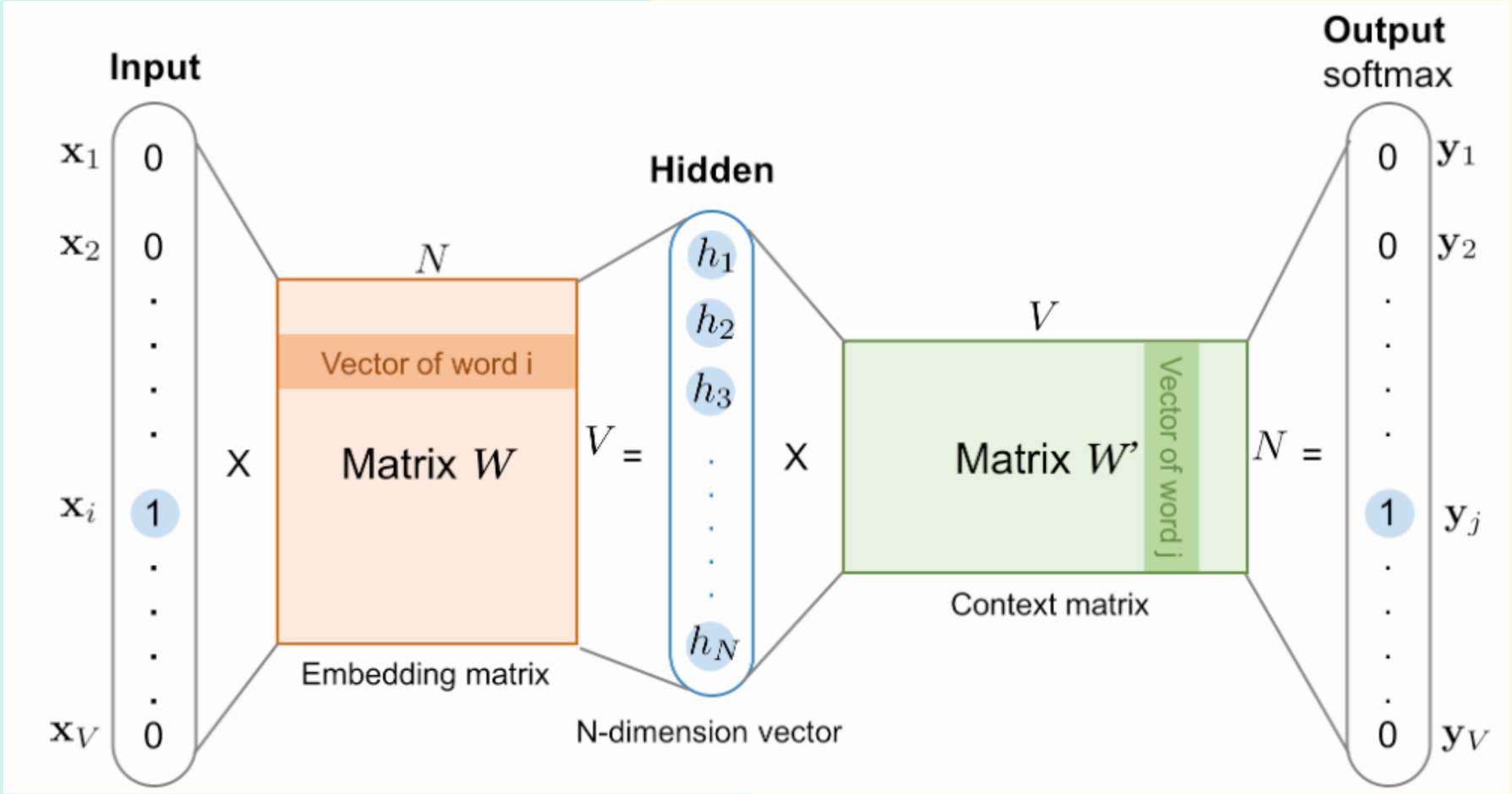
Kaan OFLAZ
Sena ATAKAN


Word2vec
DataScientest • com
King
Man
Woman
Queen

Continuous Bag-of-Words model vs Skip-gram model

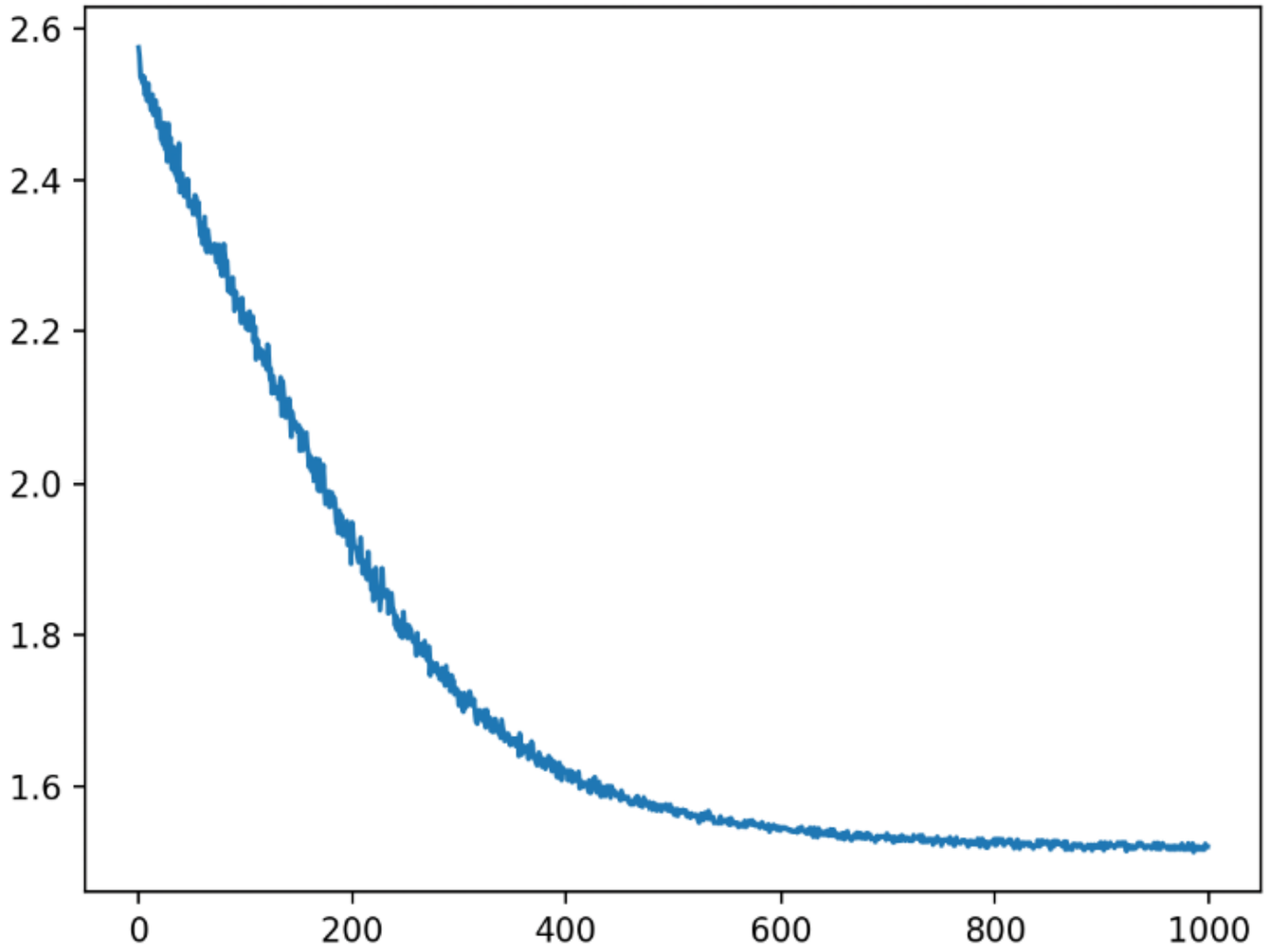


word2vec architecture

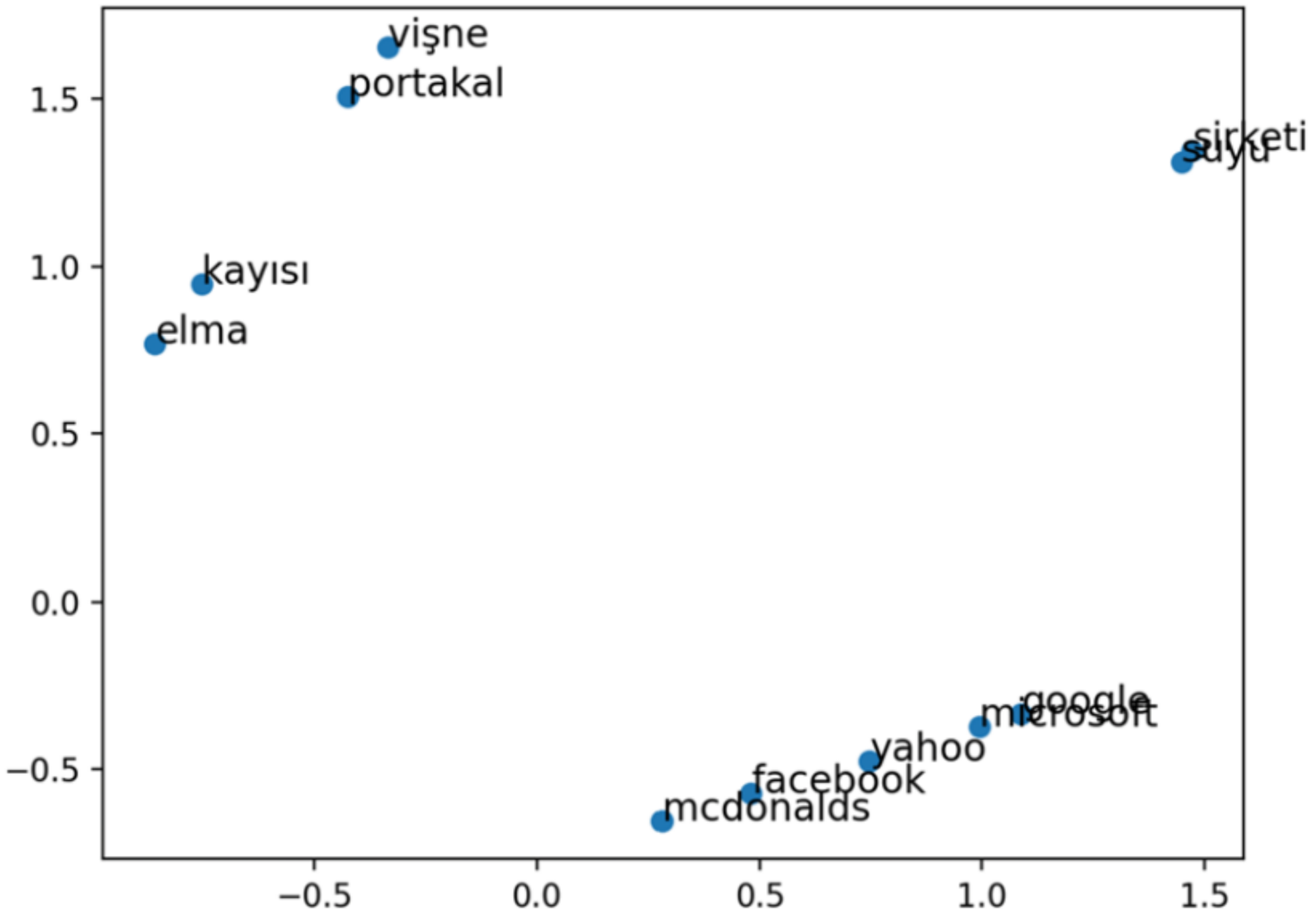


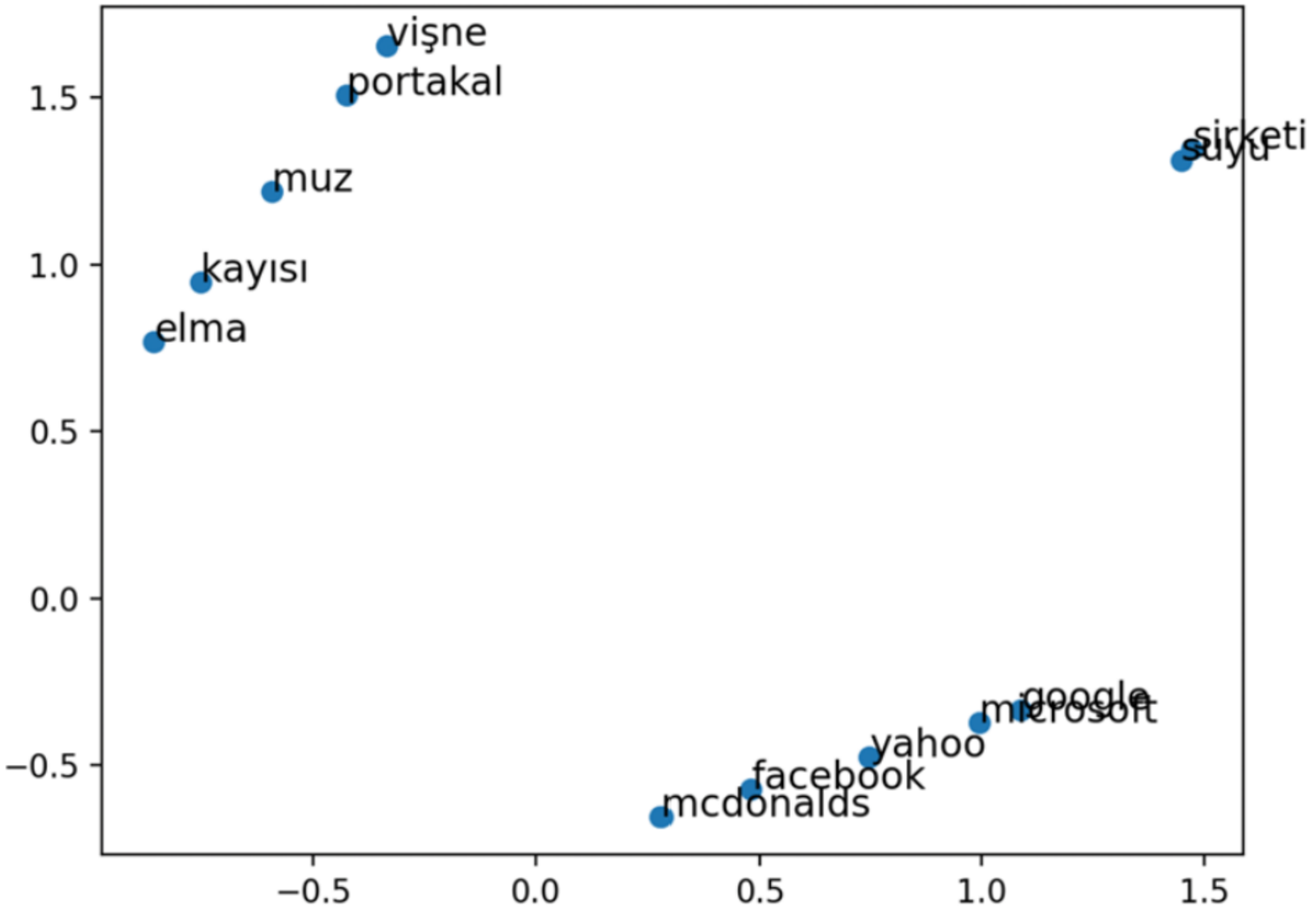
TASK 1 - RESULTS

Learning Curve

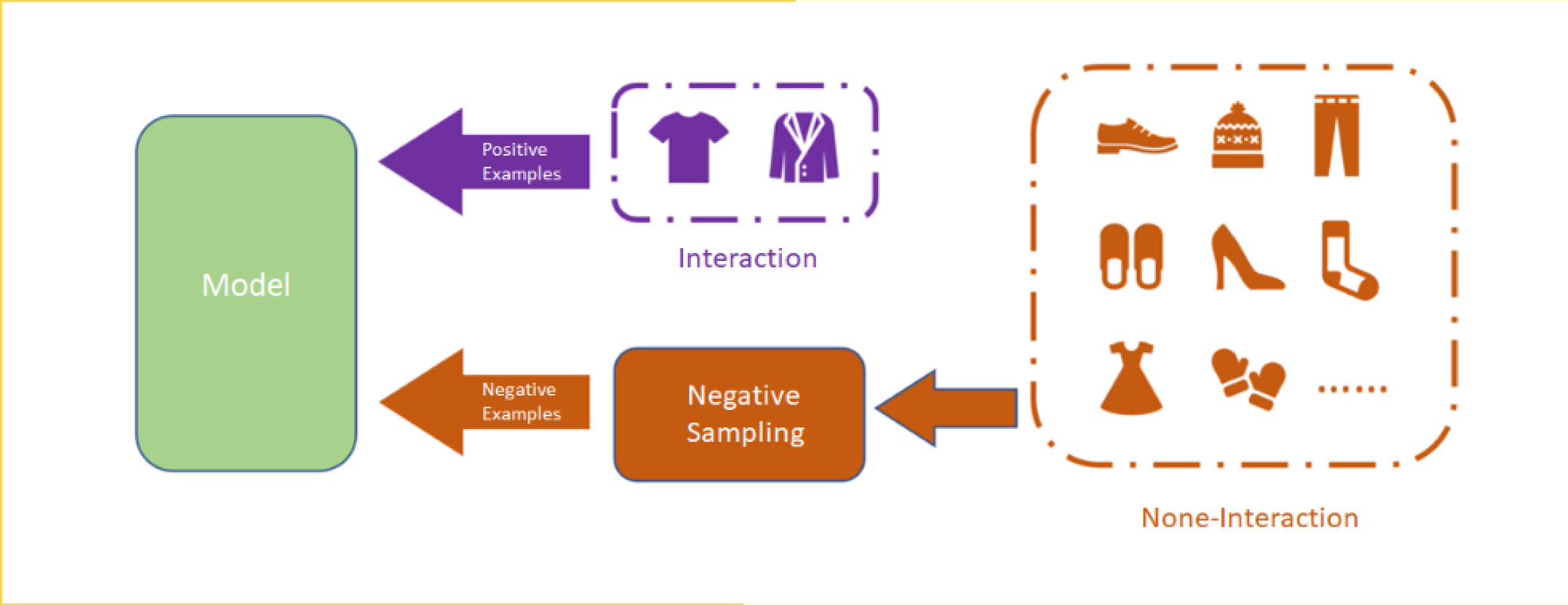


Embeddings


vişne
portakal
şirketi
şuyu
kayısı
elma
google
microsoft
yahoo
facebook
mcdonalds
1.5
1.0
0.5
0.0
−0.5
−0.5
0.0
0.5
1.0
1.5

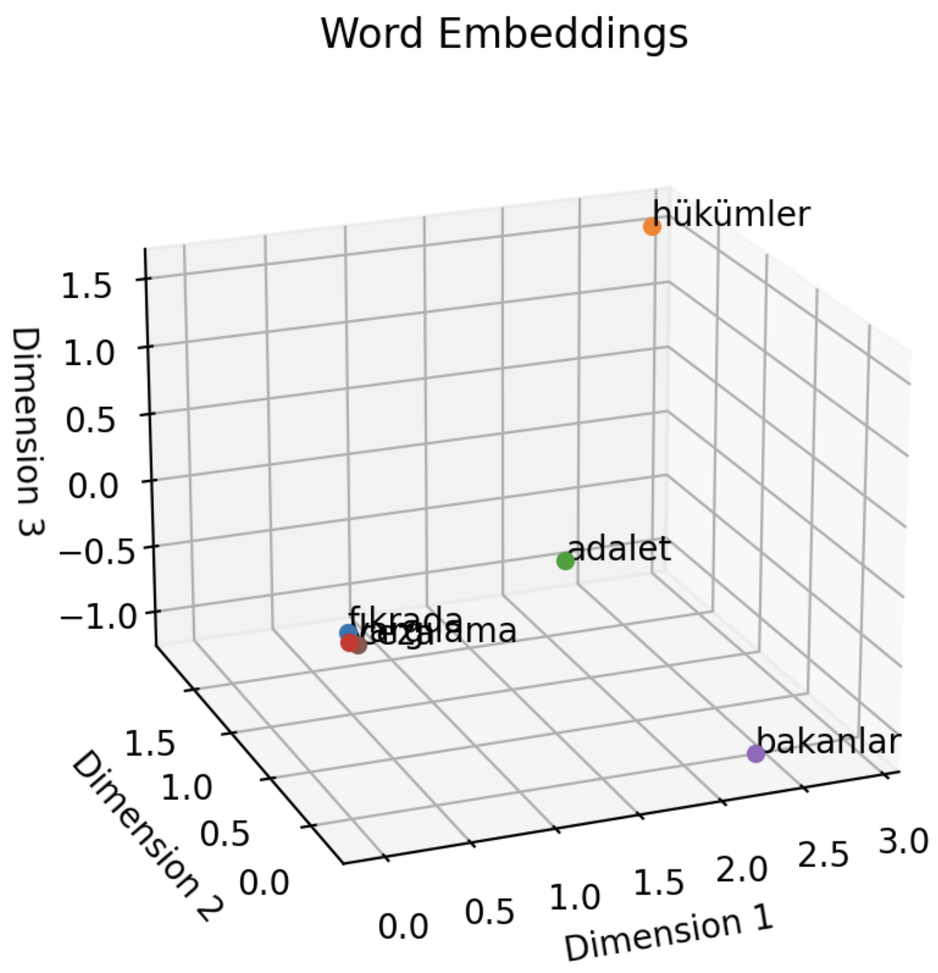

vişne
portakal
muz
kayısı
elma
şirketi
şuyu
google
microsoft
yahoo
facebook
mcdonalds
1.5
1.0
0.5
0.0
−0.5
−0.5
0.0
0.5
1.0
1.5

Negative Sampling



Window Size	Text	Skip-grams
2	[The **wide** road shimmered] in the hot sun.	wide, the wide, road wide, shimmered
	The [wide road **shimmered** in the] hot sun.	shimmered, wide shimmered, road shimmered, in shimmered, the
	The wide road shimmered in [the hot **sun**].	sun, the sun, hot
3	[The **wide** road shimmered in] the hot sun.	wide, the wide, road wide, shimmered wide, in
	[The wide road **shimmered** in the hot] sun.	shimmered, the shimmered, wide shimmered, road shimmered, in shimmered, the shimmered, hot
	The wide road shimmered [in the hot **sun**].	sun, in sun, the sun, hot

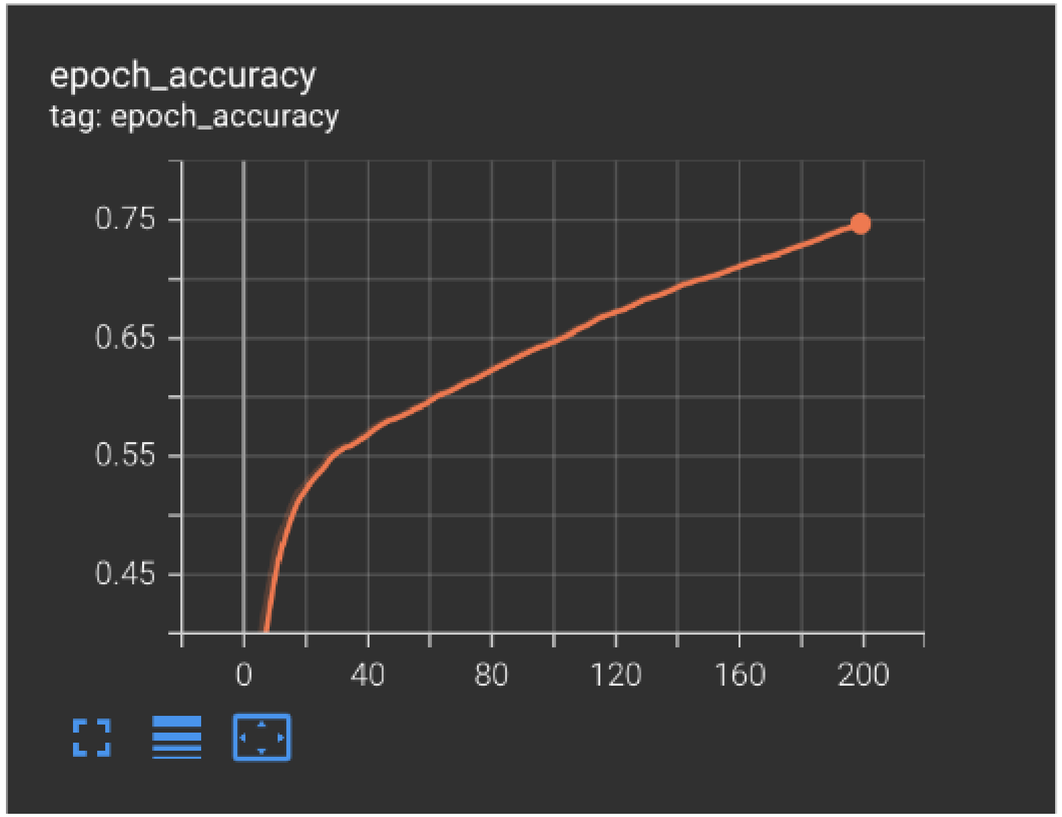
TASK 2 - RESULTS

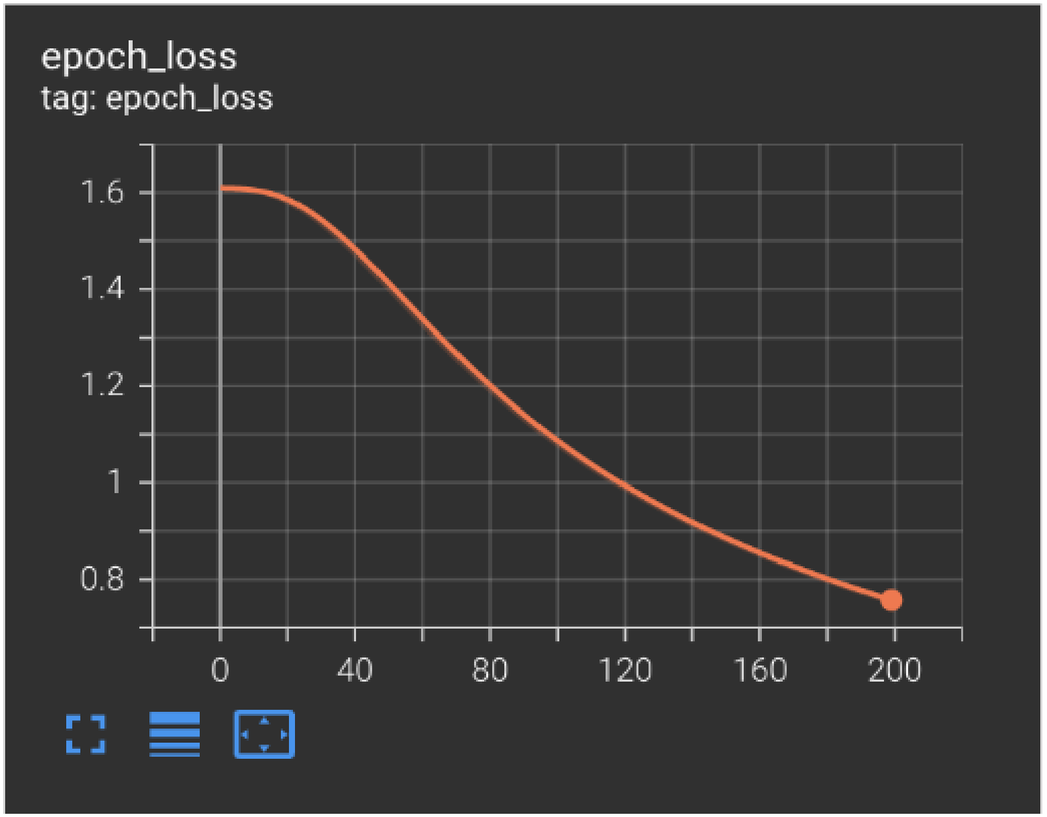


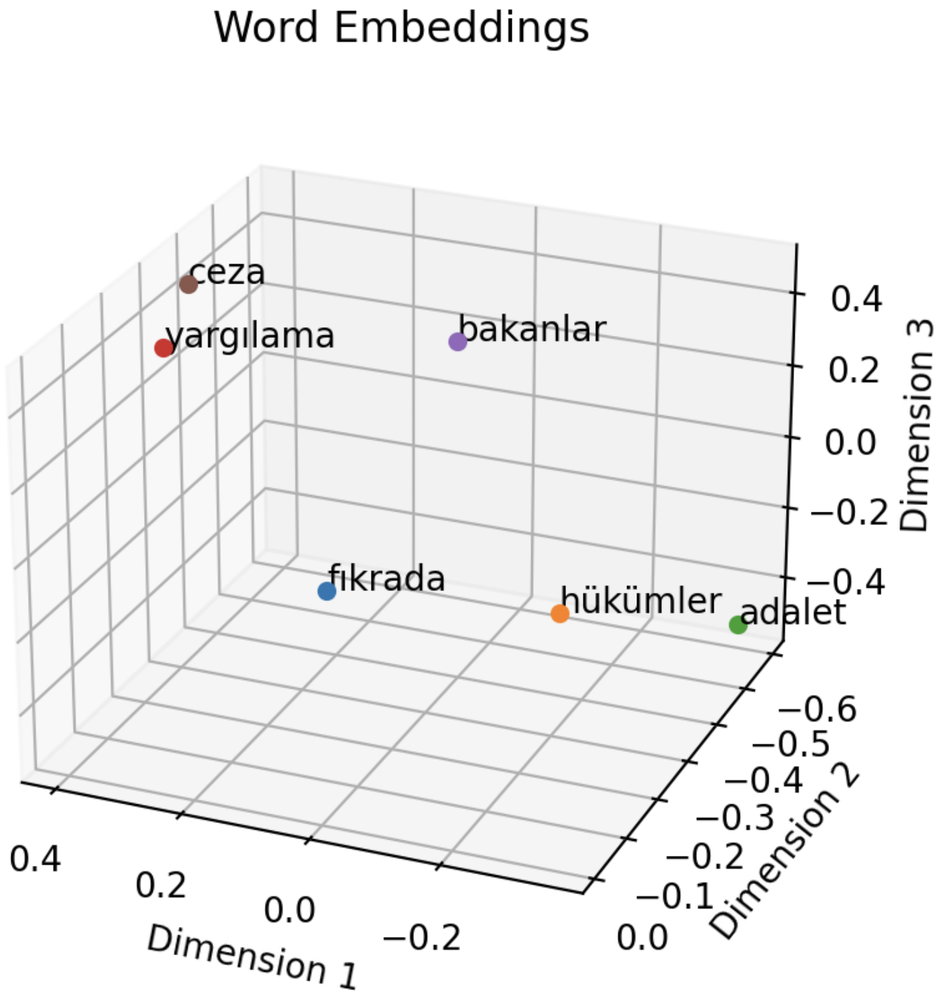
dimensions: 3

epoch: 200

accuracy: 0,7498


epoch_accuracy
tag: epoch_accuracy
0.75
0.65
0.55
0.45
0
40
80
120
160
200

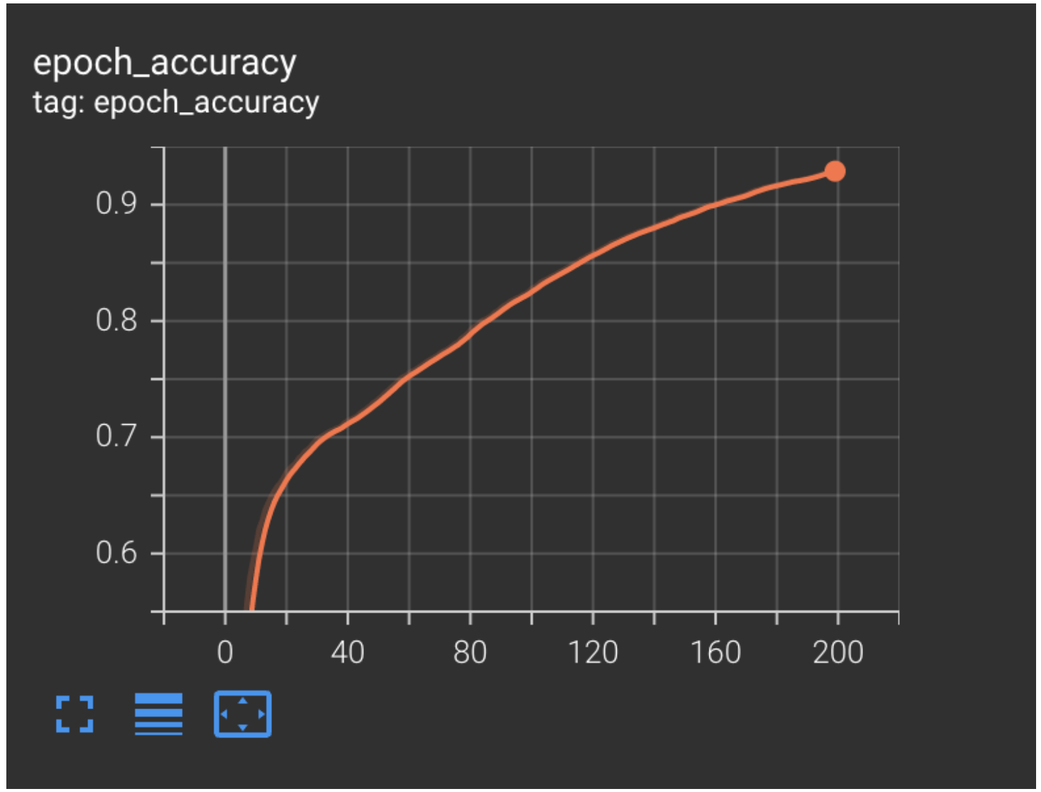

epoch_loss
tag: epoch_loss
1.6
1.4
1.2
1
0.8
0
40
80
120
160
200

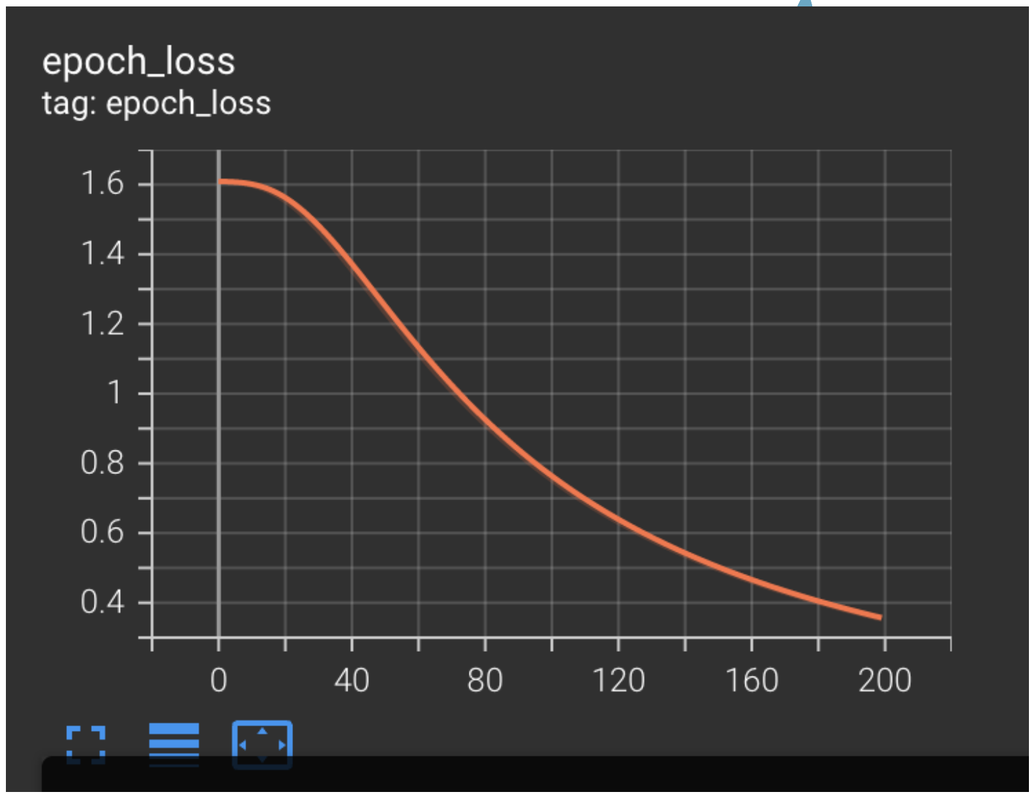


dimensions: 80

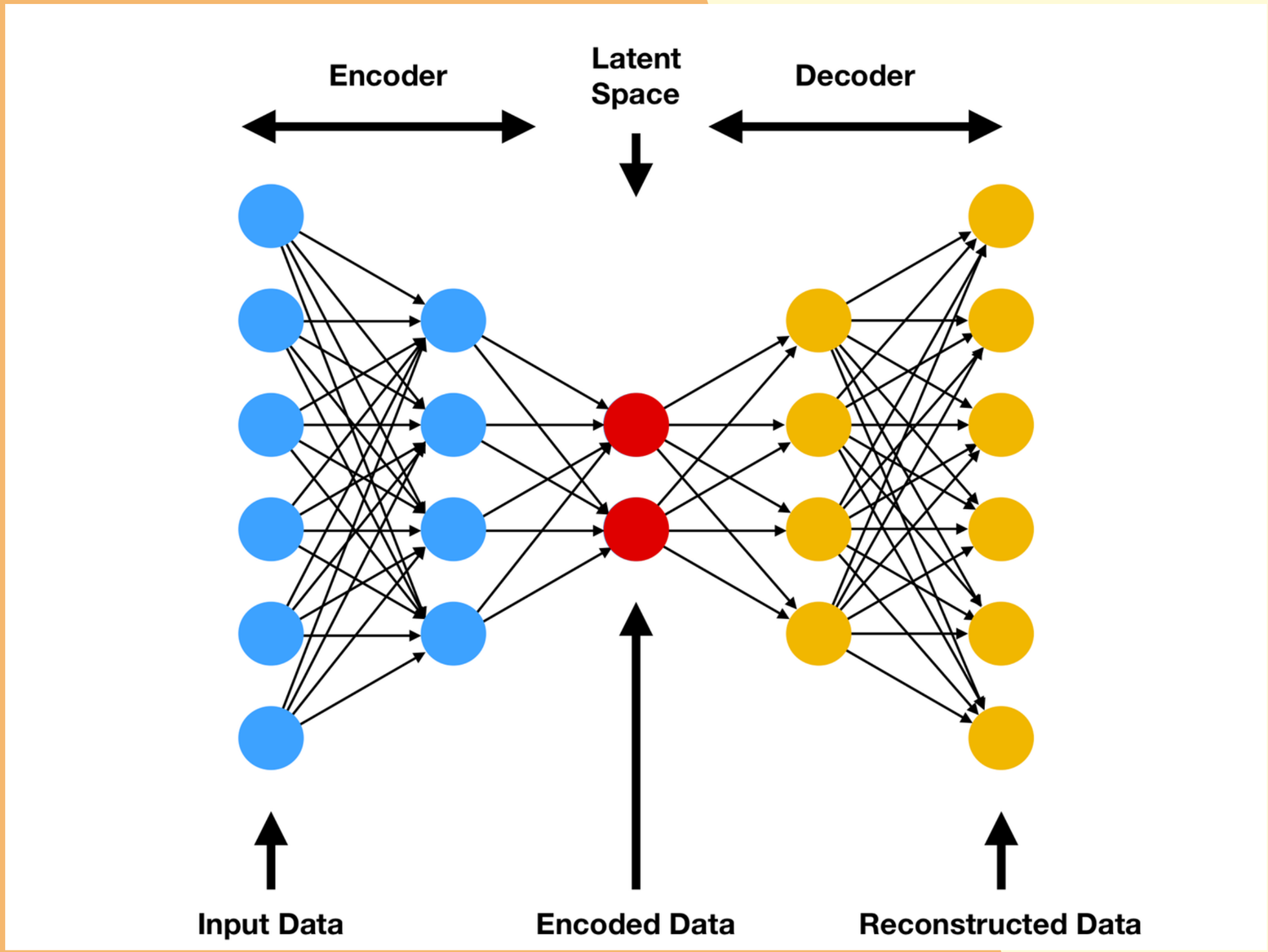
epoch: 200

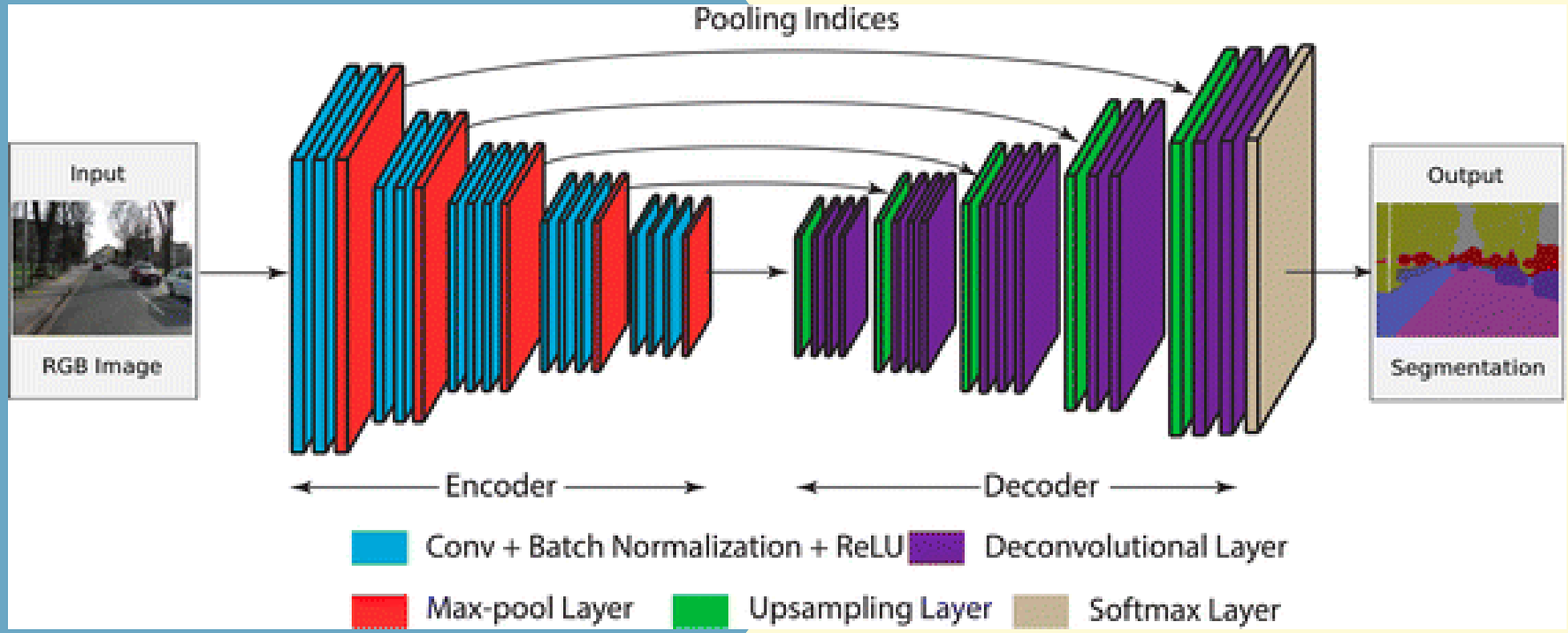
accuracy: 0,9986


epoch_accuracy
tag: epoch_accuracy
0.9
0.8
0.7
0.6
0
40
80
120
160
200


epoch_loss
tag: epoch_loss
1.6
1.4
1.2
1
0.8
0.6
0.4
0
40
80
120
160
200

autoencoder

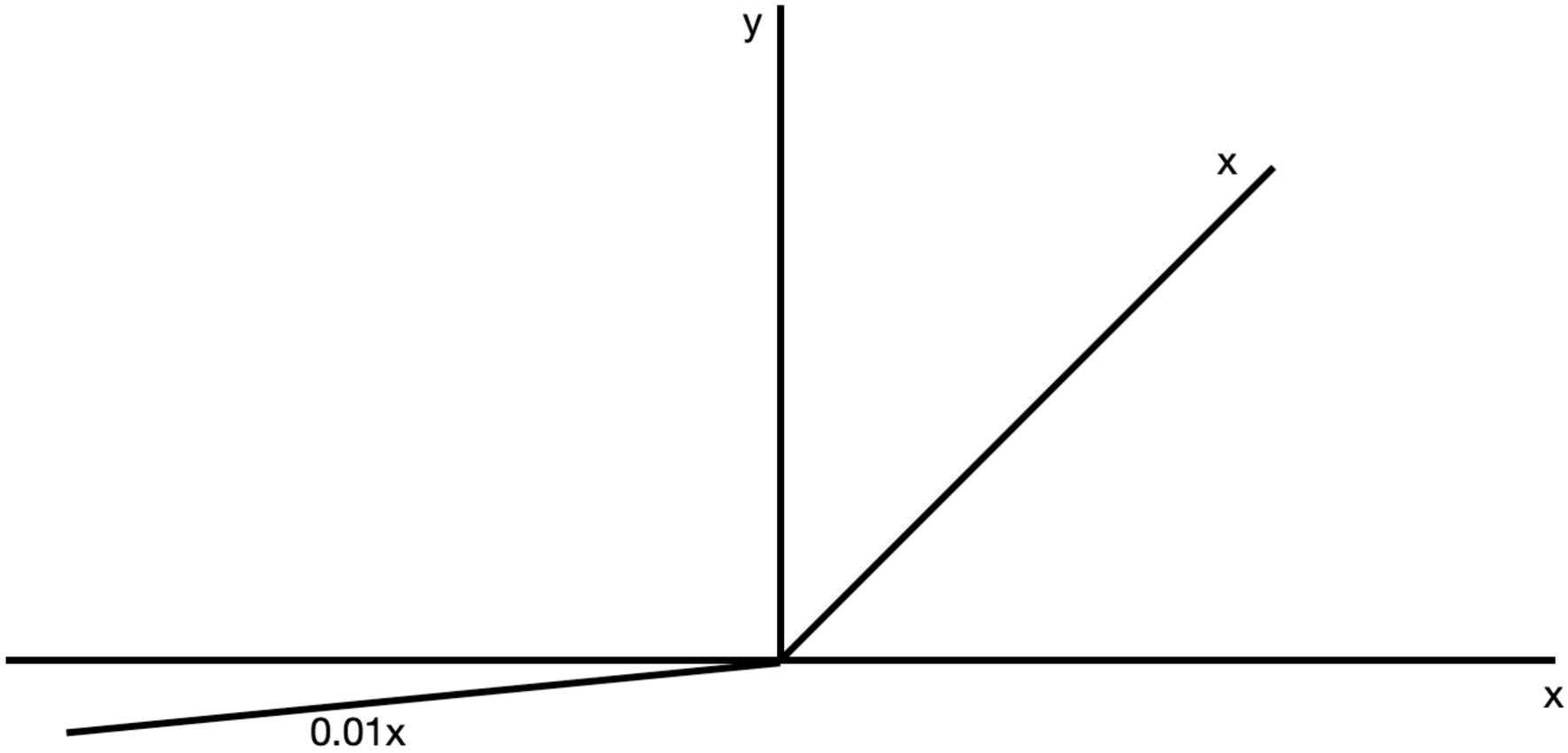


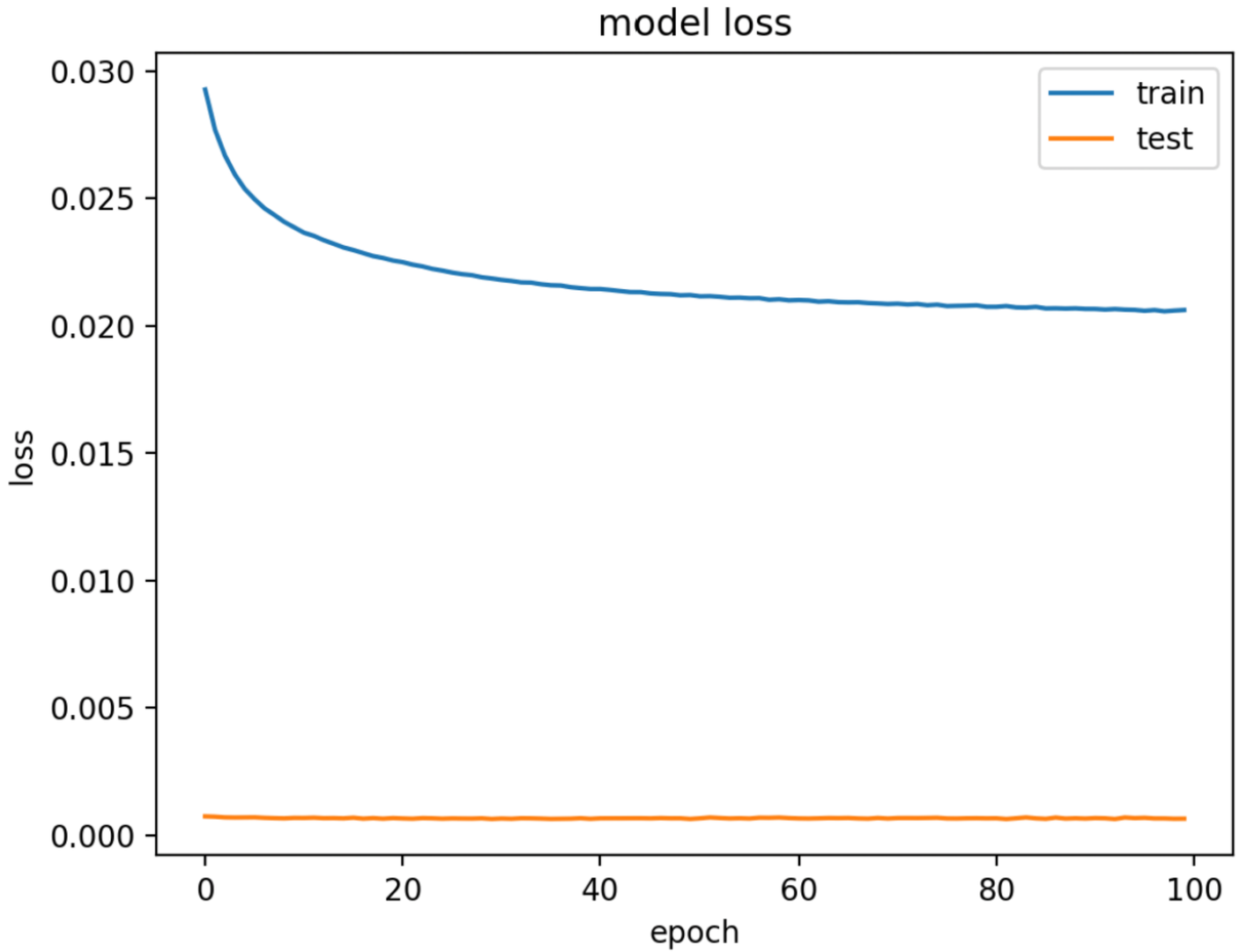

Pooling Indices
Input
RGB Image
Output
Segmentation
Encoder
Decoder
Conv + Batch Normalization + ReLU
Deconvolutional Layer
Max-pool Layer
Upsampling Layer
Softmax Layer

TASK 4 - RESULTS

```
Model: "auto_encoders"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 sequential (Sequential)     (None, 40)                195800

 sequential_1 (Sequential)   (None, 400)               197800

=================================================================
Total params: 393,600
Trainable params: 393,600
Non-trainable params: 0
_________________________________________________________________
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 dense (Dense)               (None, 320)               128320

 dense_1 (Dense)             (None, 160)               51360

 dense_2 (Dense)             (None, 80)                12880

 dense_3 (Dense)             (None, 40)                3240

=================================================================
Total params: 195,800
Trainable params: 195,800
Non-trainable params: 0
_________________________________________________________________
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 dense_4 (Dense)             (None, 40)                1640

 dense_5 (Dense)             (None, 80)                3280

 dense_6 (Dense)             (None, 160)               12960

 dense_7 (Dense)             (None, 320)               51520

 dense_8 (Dense)             (None, 400)               128400

=================================================================
Total params: 197,800
Trainable params: 197,800
```

why leaky relu?




model loss
train
test
loss
epoch
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
100

TEŞEKKÜRLER <3