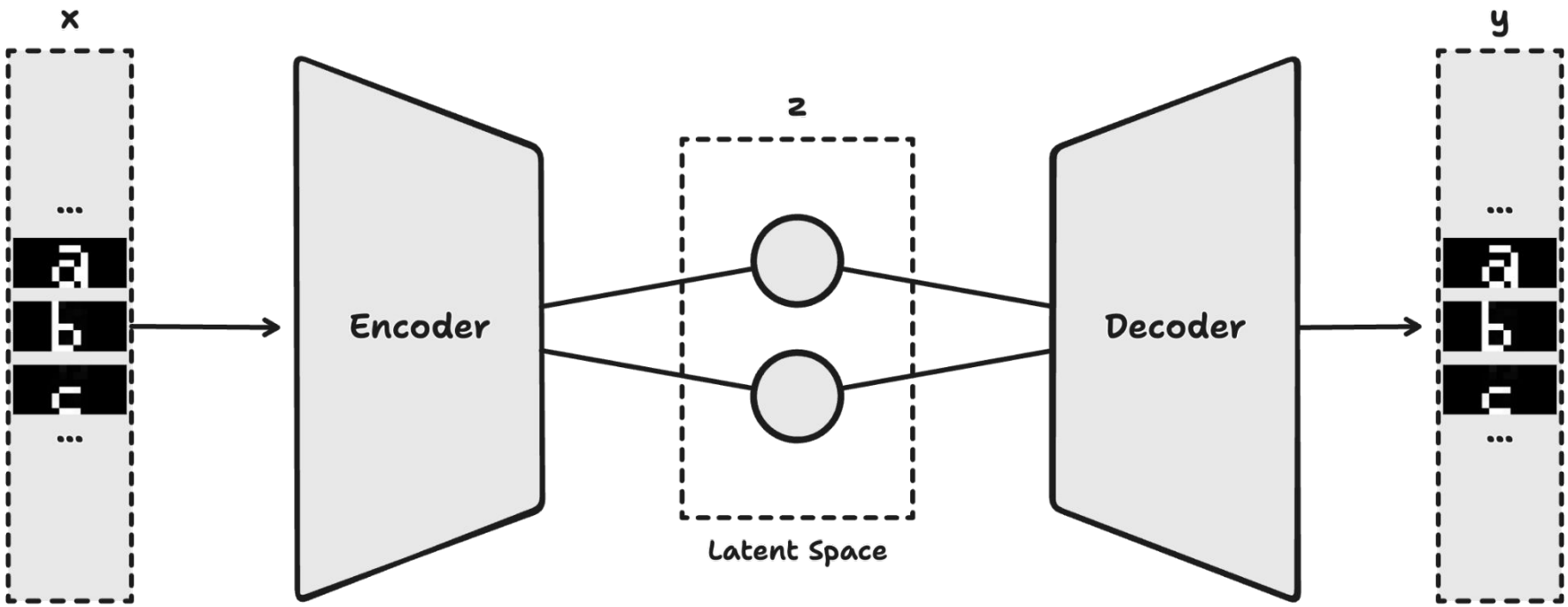
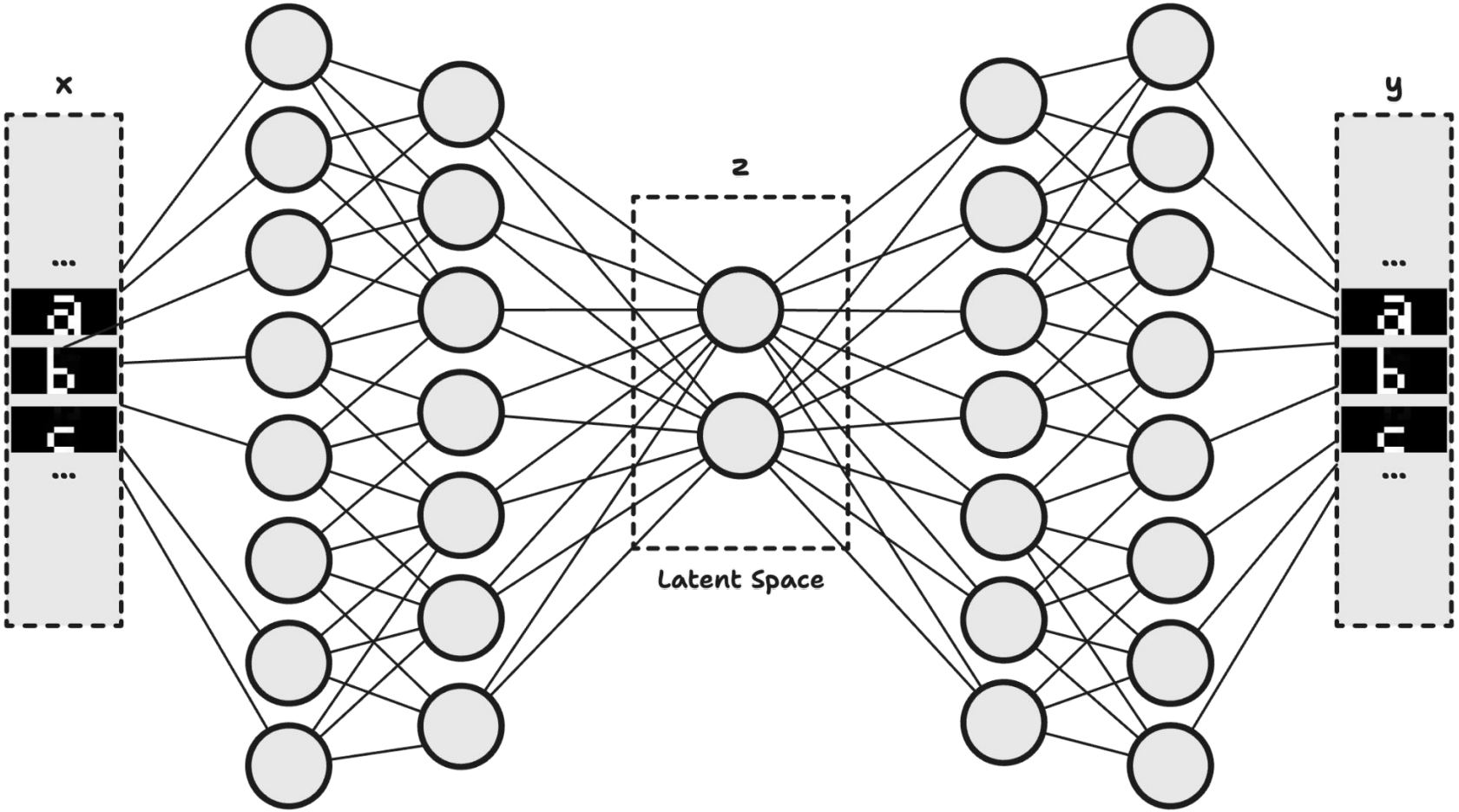
TP5
Deep Learning

Grupo 2

Tabla de contenidos

Autoencoders


x
...
...
Encoder
z
Latent Space
Decoder
y
...
...

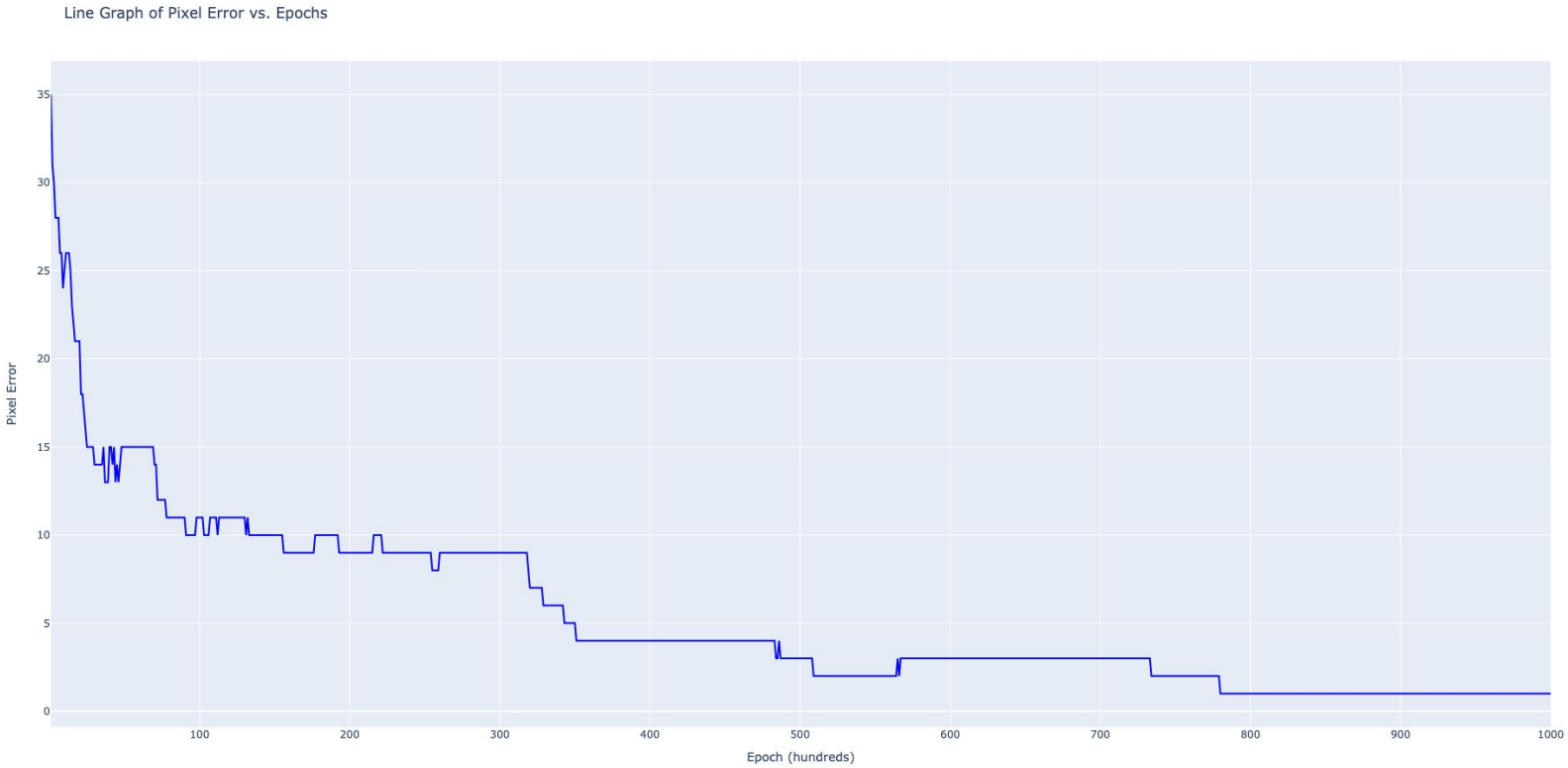

x
...
...
z
Latent Space
y
...
...

AE: Arquitectura

AE: Arquitectura

100k epochs, 0.0001 learning rate, 32 batch size, pixel error

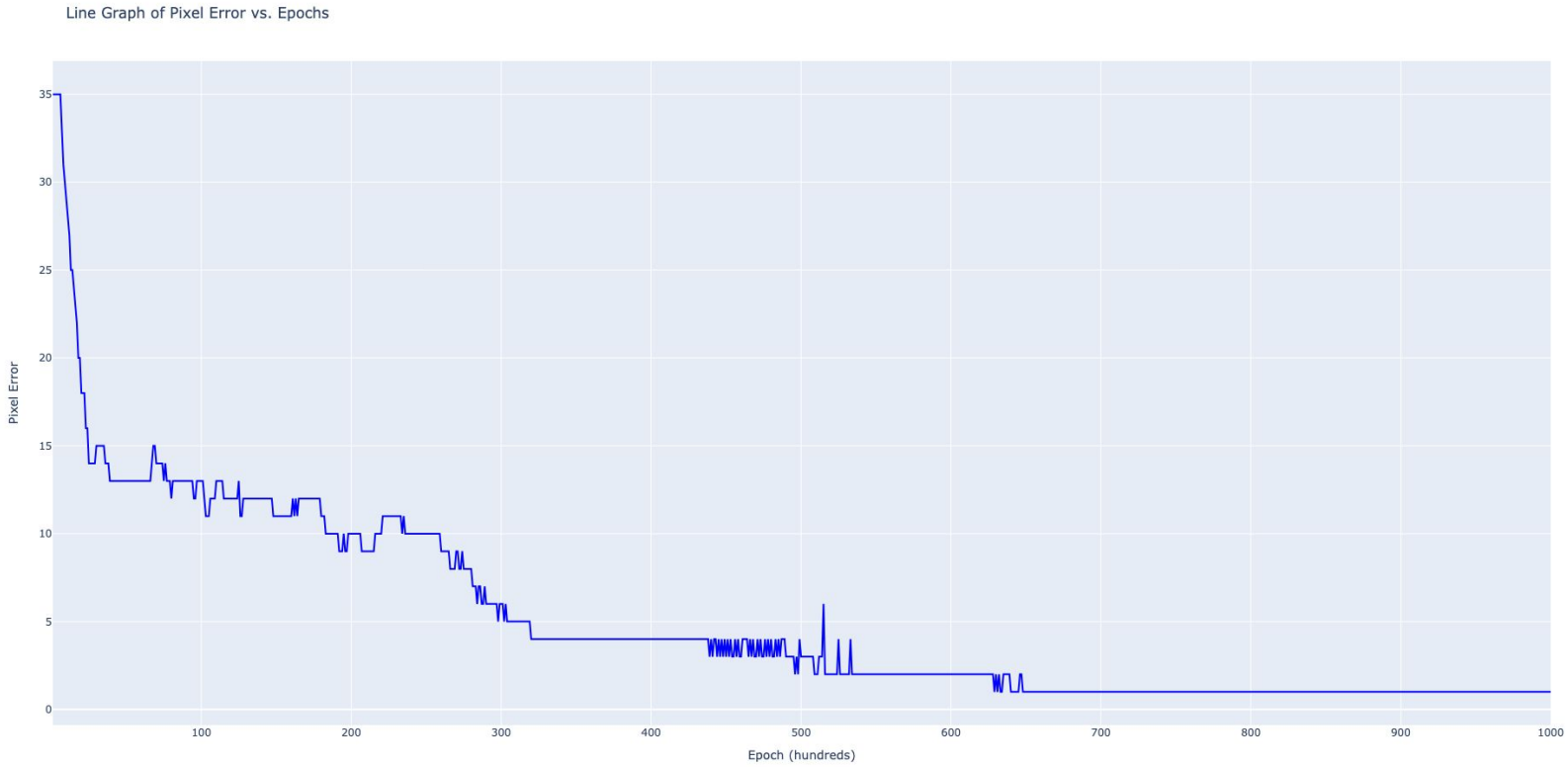
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]



AE: Arquitectura

100k epochs , 0.0001 learning rate, 32 batch size, pixel error

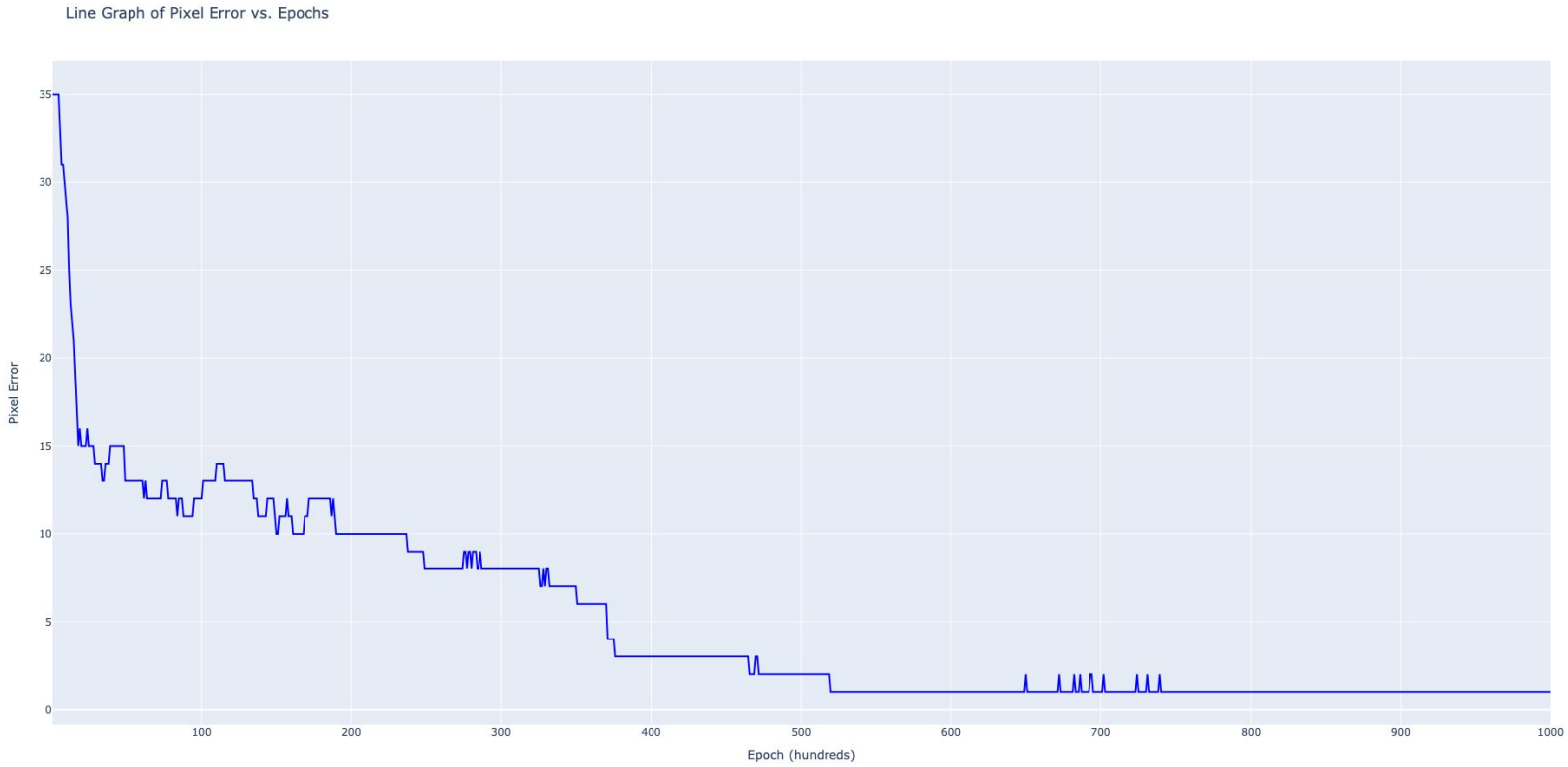
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 30, 20, 10, 5, 2, 5, 10, 20, 30, 35]



AE: Arquitectura

100k epochs , 0.01 learning rate, 32 batch size, pixel error

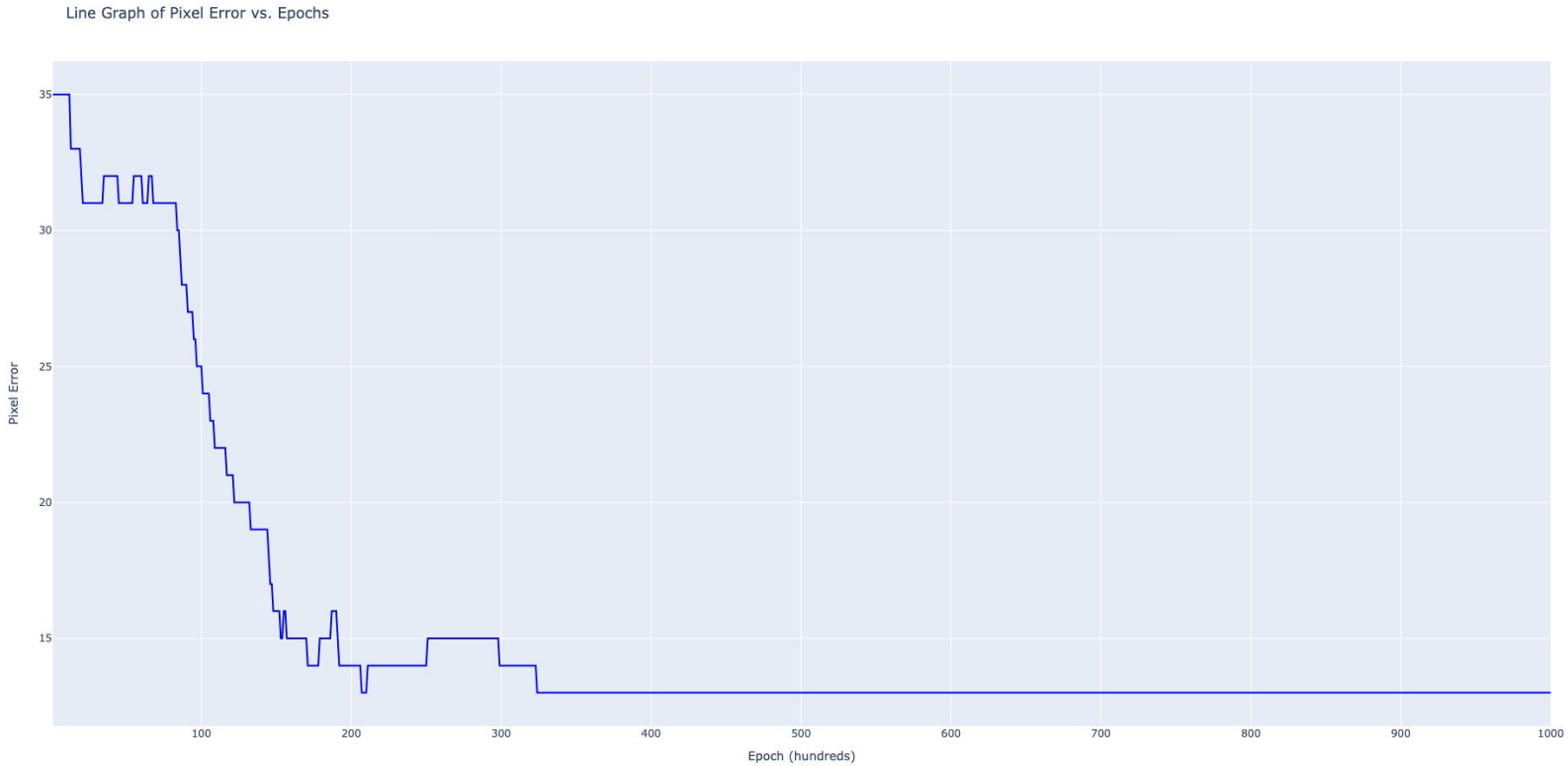
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 30, 20, 10, 5, 2, 5, 10, 20, 30, 35]



AE: Arquitectura

100k epochs , 0.0001 learning rate, 32 batch size, pixel error

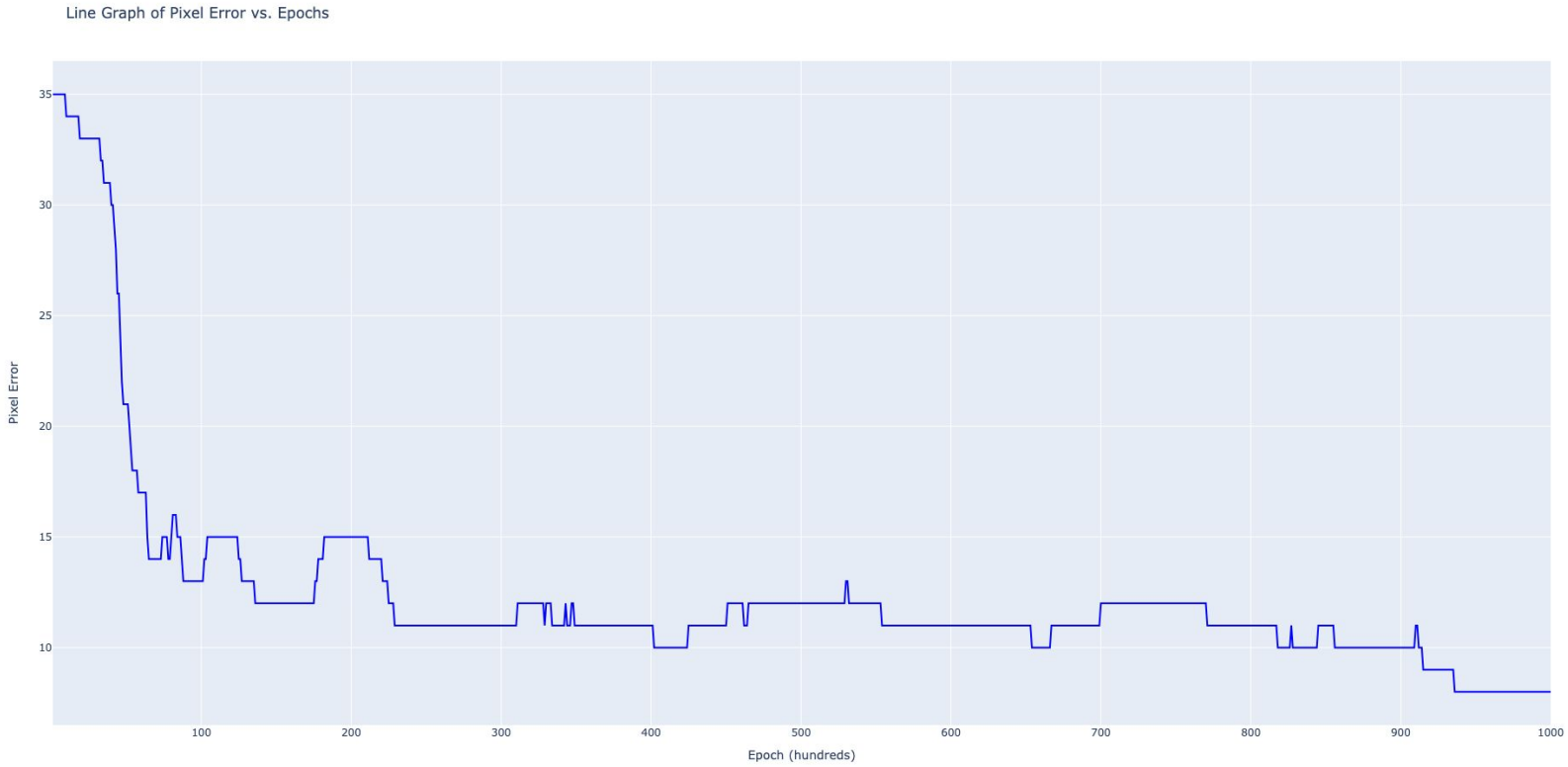
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 2, 35]



AE: Arquitectura

100k epochs , 0.0001 learning rate, 32 batch size, pixel error

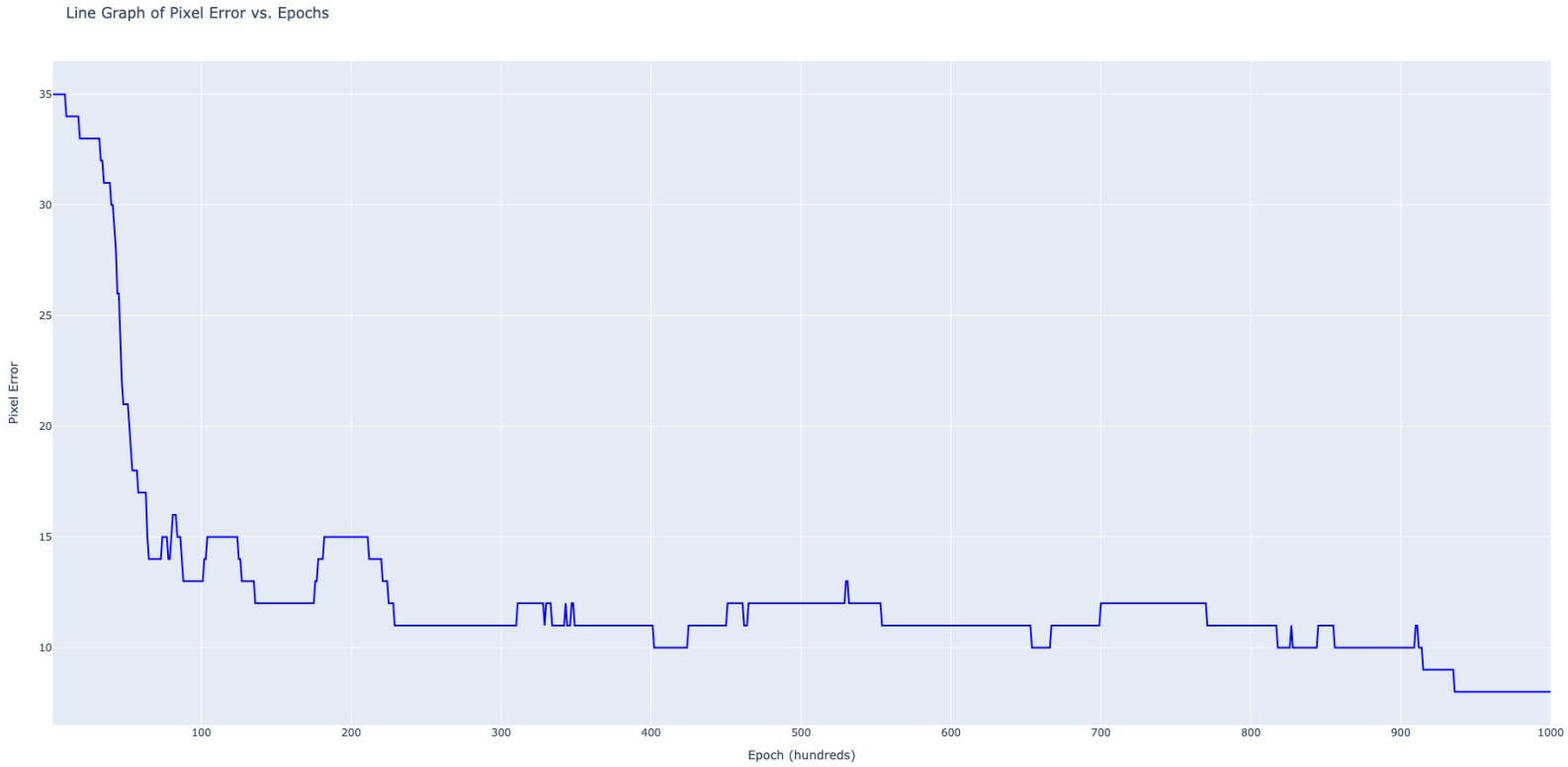
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 10, 2, 10, 35]



AE: Arquitectura

100k epochs , 0.0001 learning rate, 32 batch size, pixel error

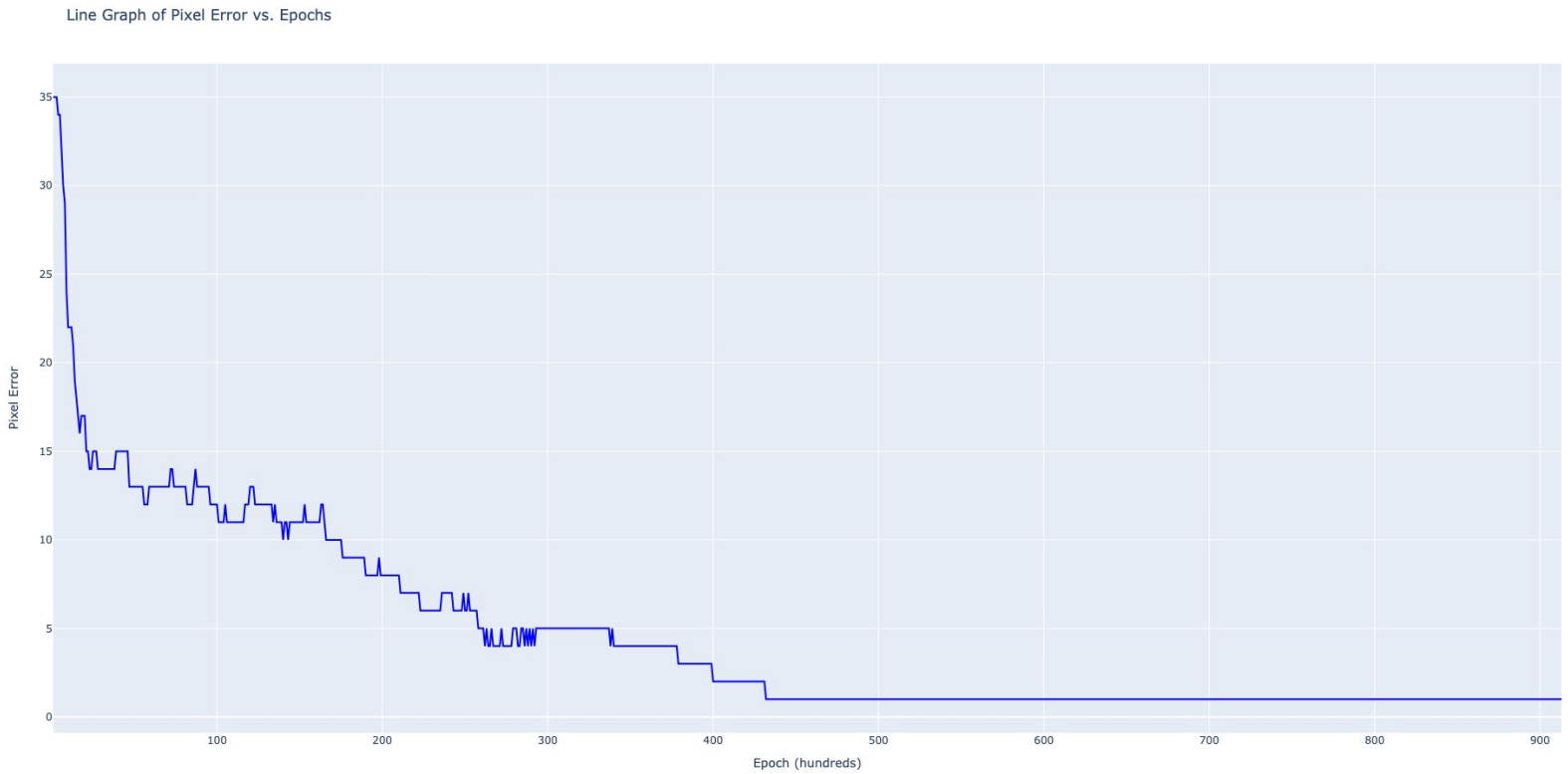
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 10, 2, 10, 35]



AE: Arquitectura

100k epochs , 0.0001 learning rate, 32 batch size, pixel error

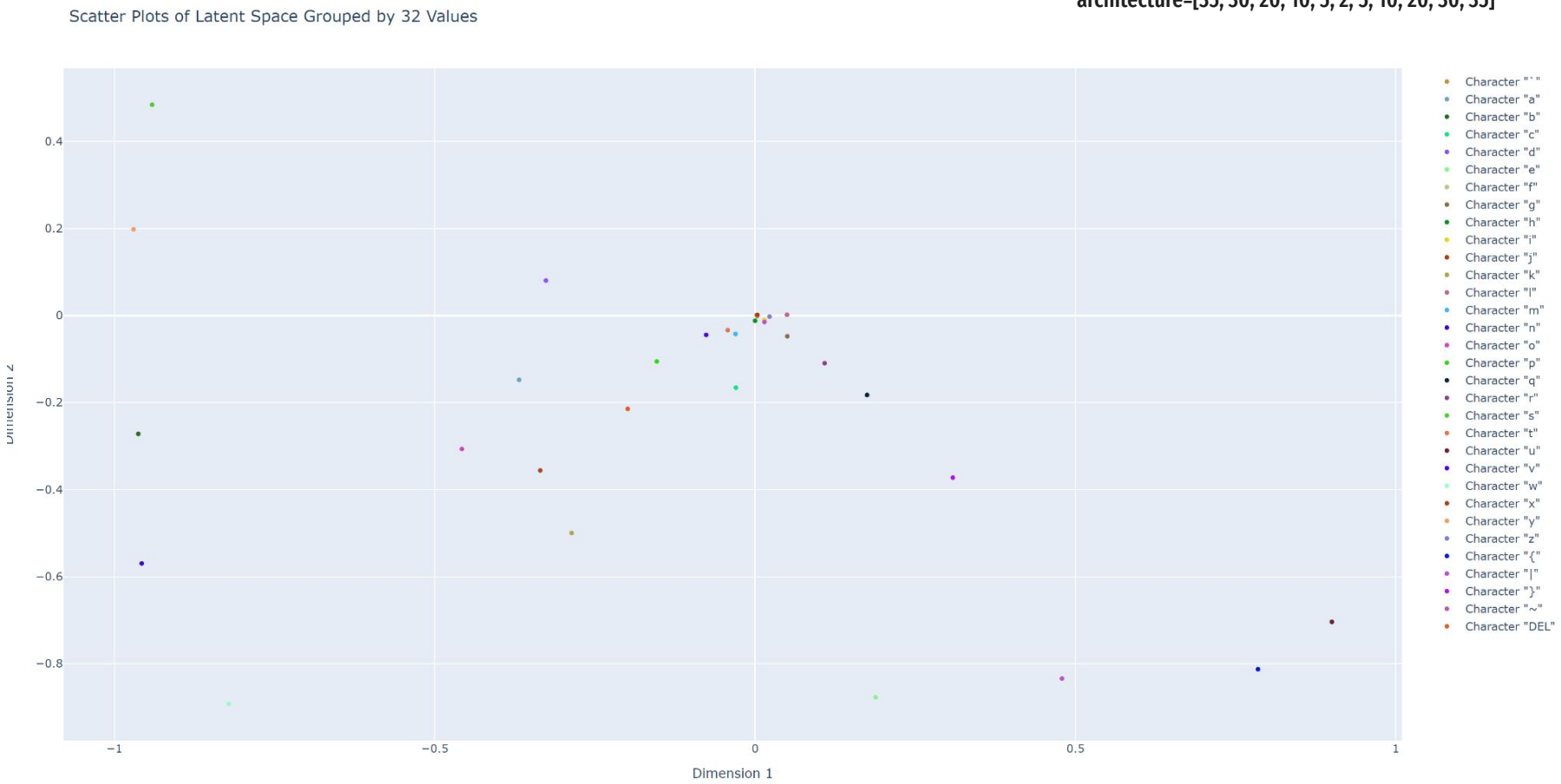
activation=SIGMOID,
activation_prime=_SIGMOID_DERIVATIVE,
optimizer=Adam,
architecture=[35, 30, 20, 10, 5, 2, 5, 10, 20, 30, 35]



AE: Espacio latente

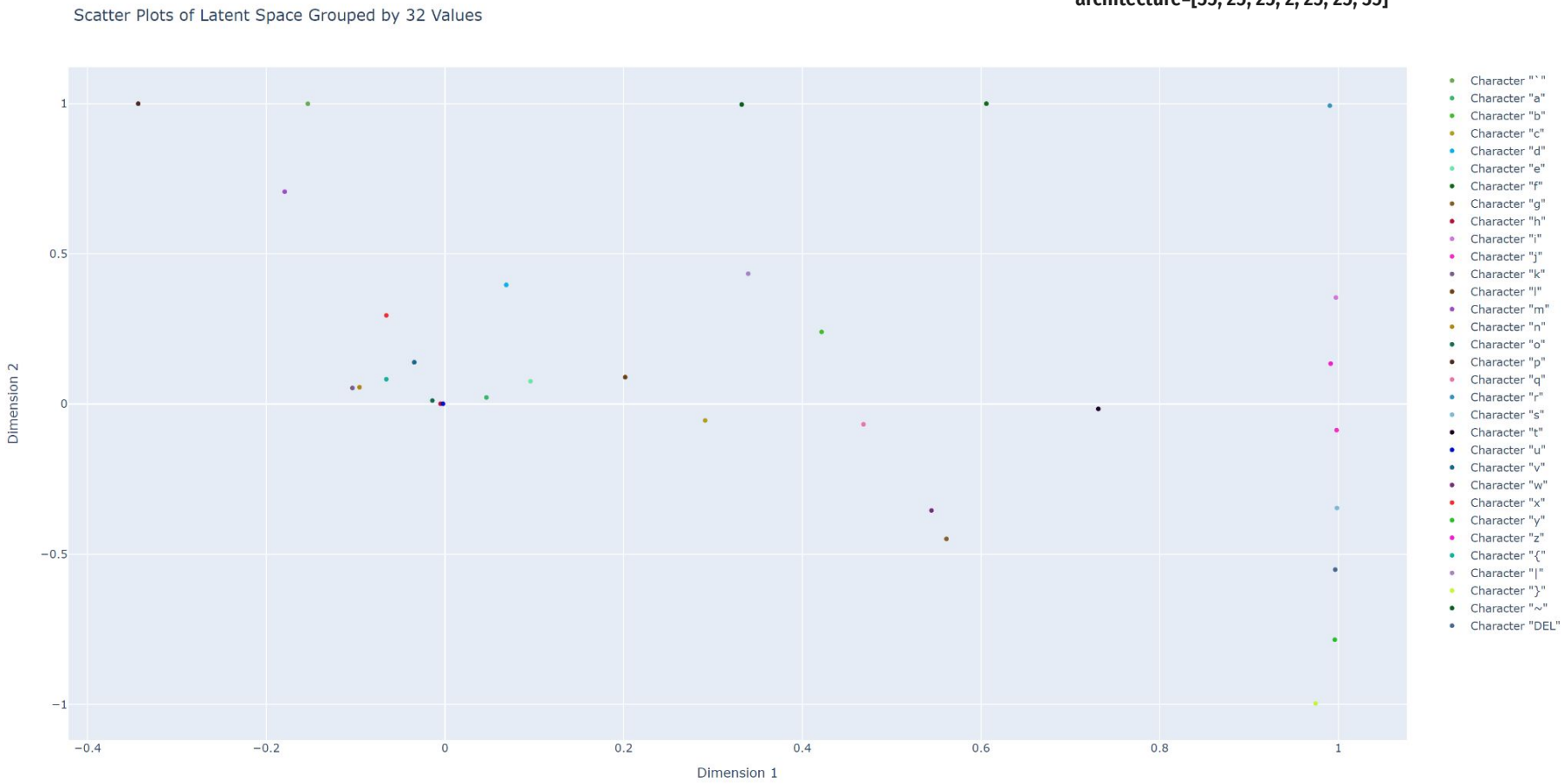
AE: Entrada al espacio latente

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 30, 20, 10, 5, 2, 5, 10, 20, 30, 35]

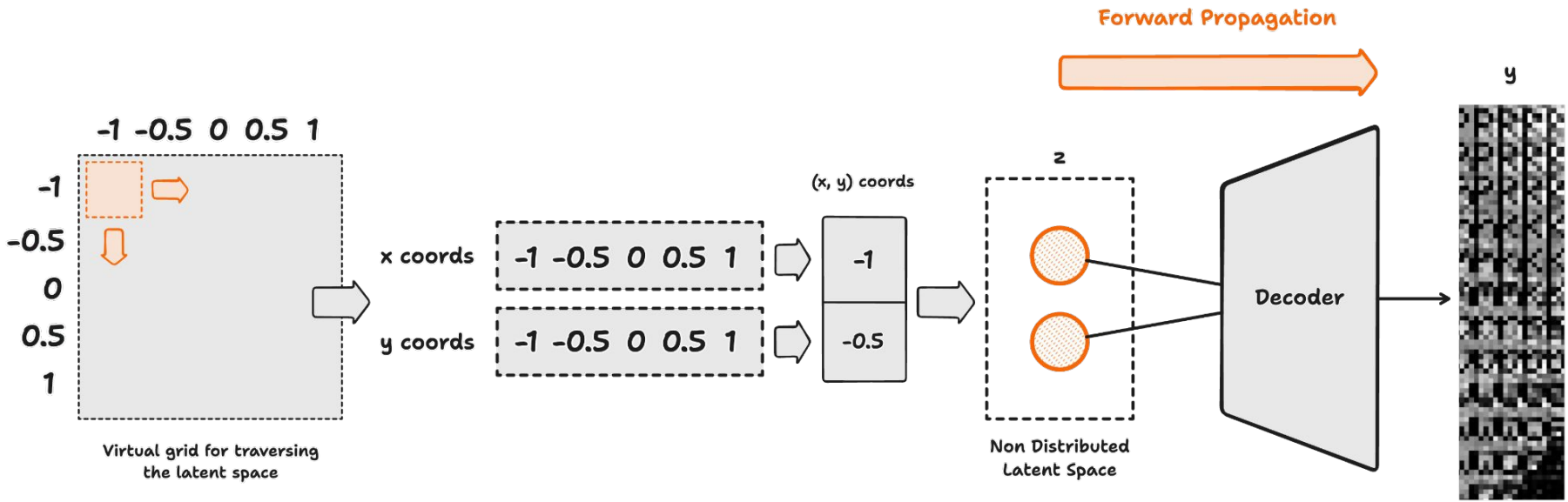


AE: Entrada al espacio latente

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]

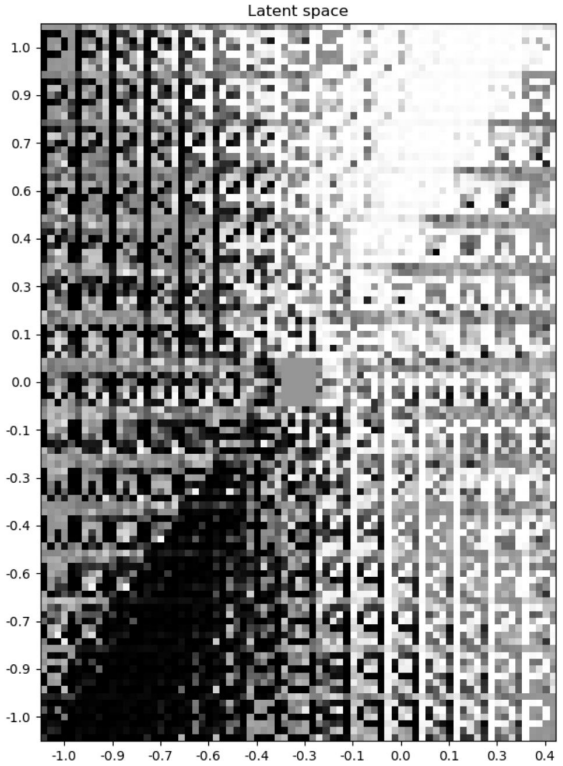


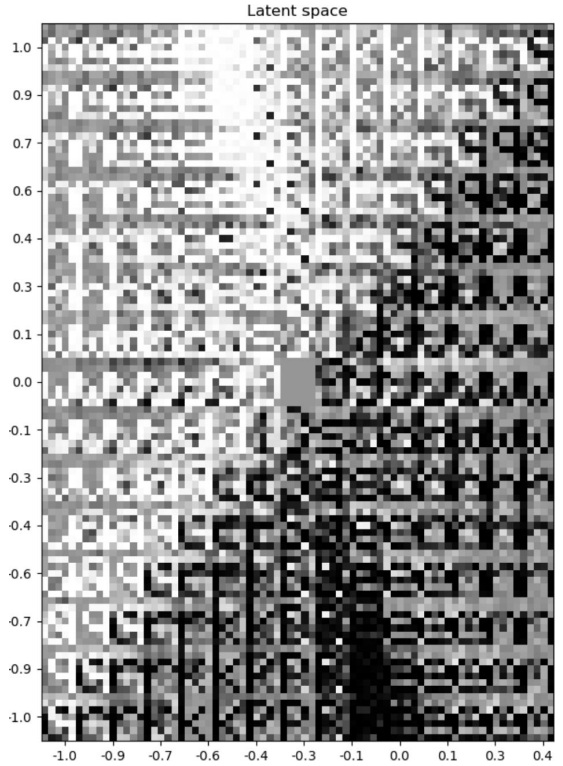
AE: Letras no existentes


Forward Propagation
y
-1 -0.5 0 0.5 1
-1
-0.5
0
0.5
1
Virtual grid for traversing the latent space
x coords
-1 -0.5 0 0.5 1
y coords
-1 -0.5 0 0.5 1
(x, y) coords
-1
-0.5
z
Non Distributed Latent Space
Decoder

AE: New letters

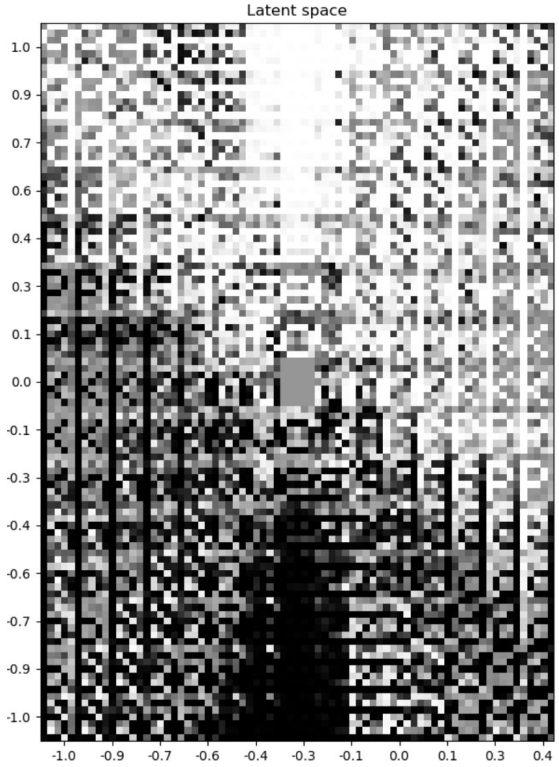
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 25, 2, 25, 25, 25, 35]

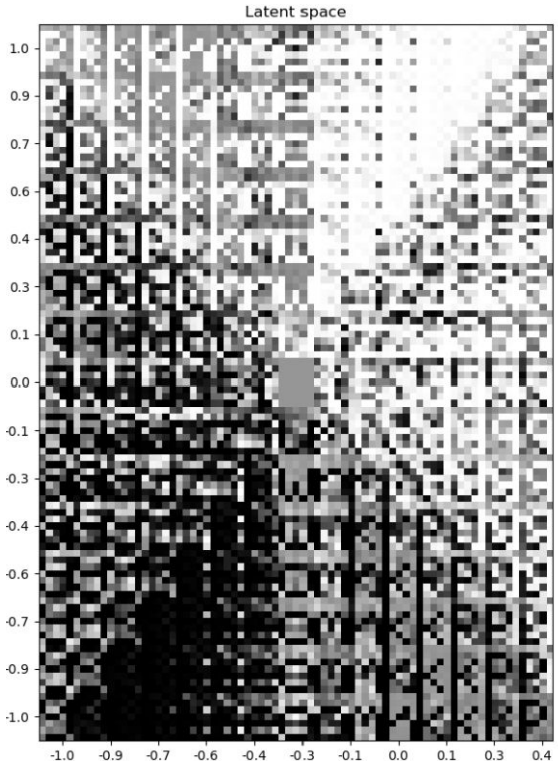




AE: New letters

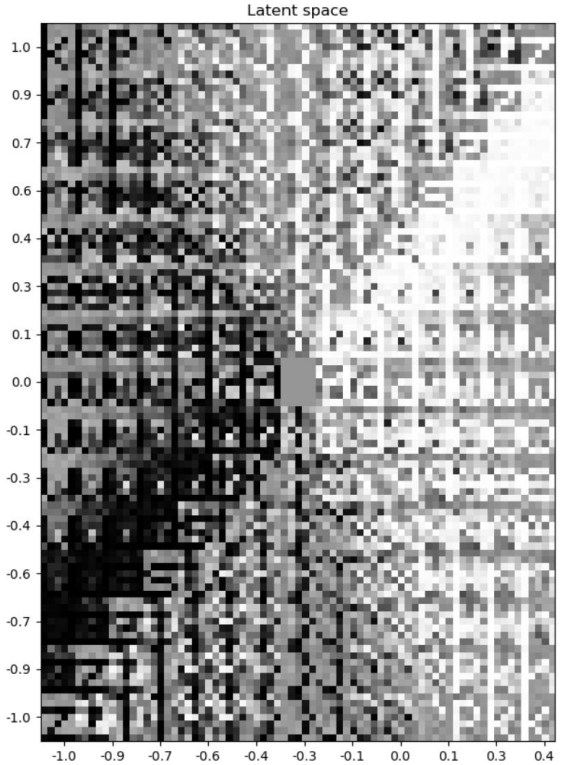
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 30, 20, 10, 5, 2, 5, 10, 20, 30, 35]

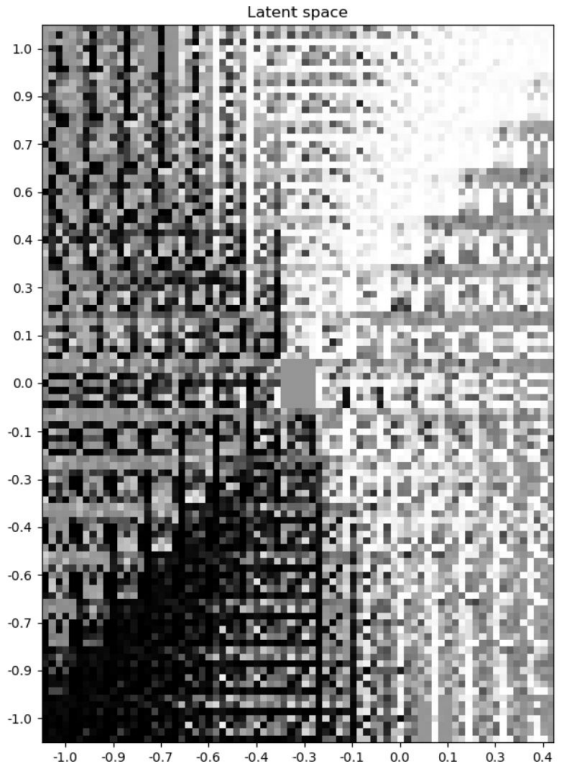




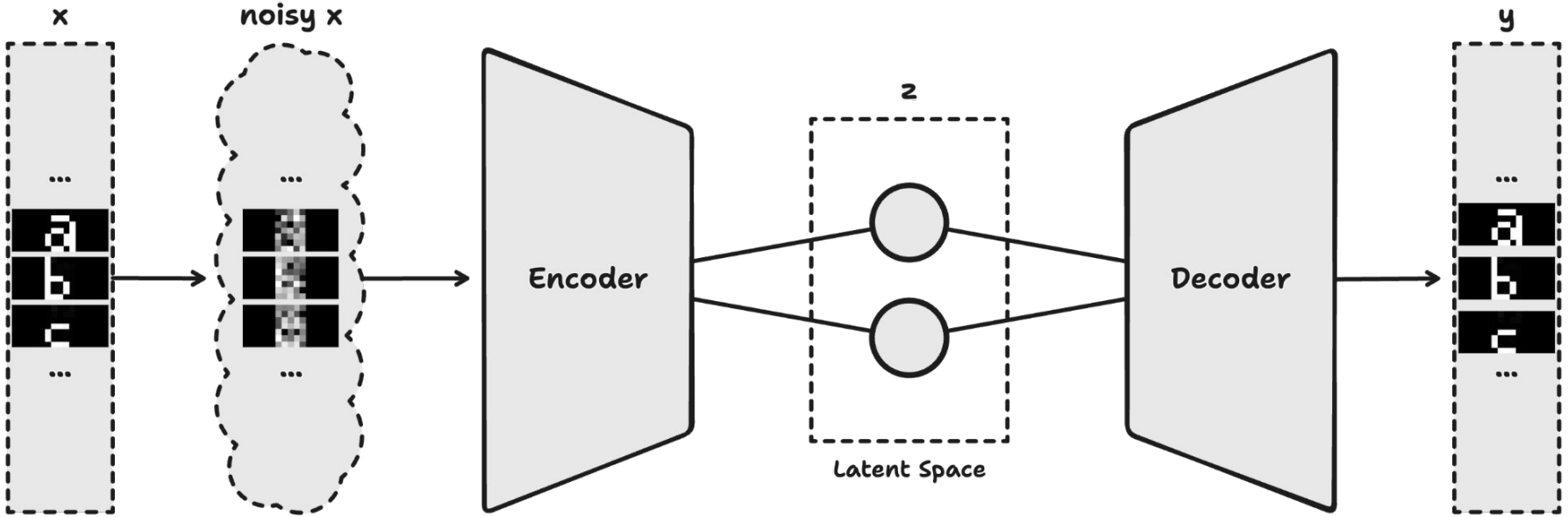
AE: New letters

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 60, 60, 60, 60, 2, 60, 60, 60, 60, 35]





Denoising Autoencoder


x
noisy x
Encoder
z
Latent Space
Decoder
y

Denoising AE: Eliminación de ruido

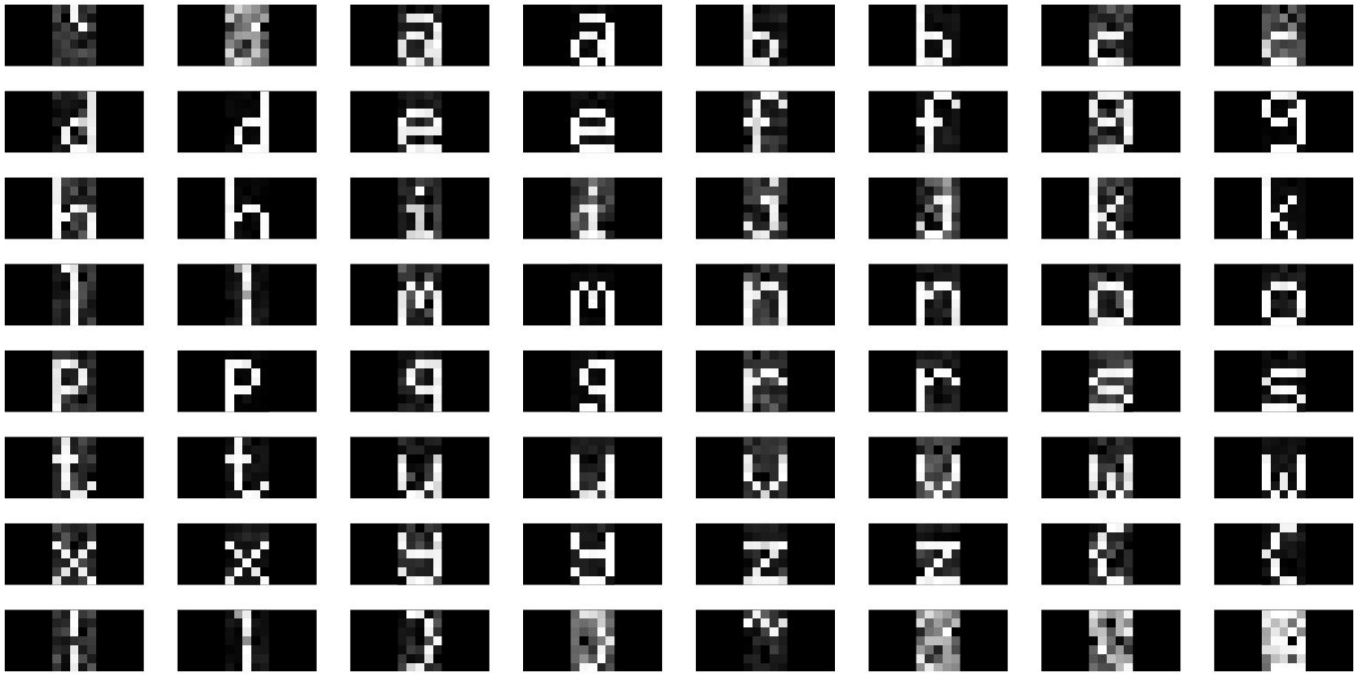
Variación de la cantidad de Ruido

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]

Denoising AE

0.15 noise, 50k epochs

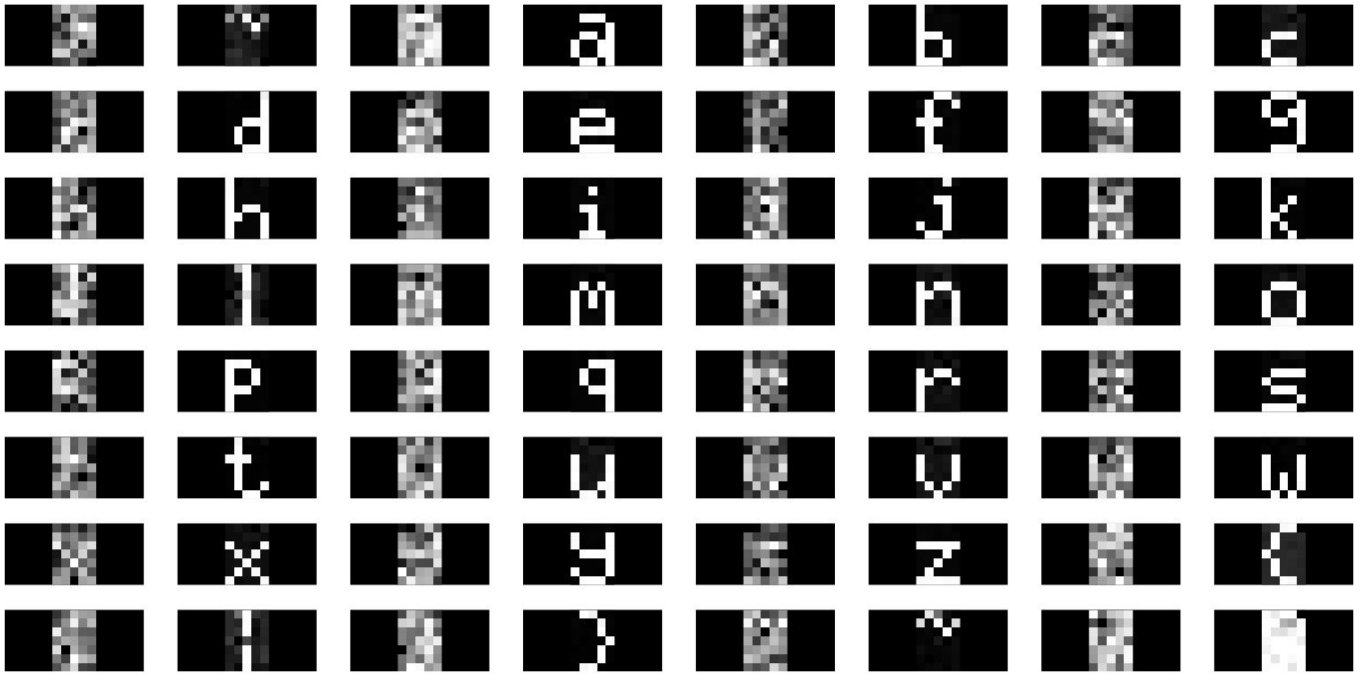
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Denoising AE

0.5 noise, 100k epochs

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



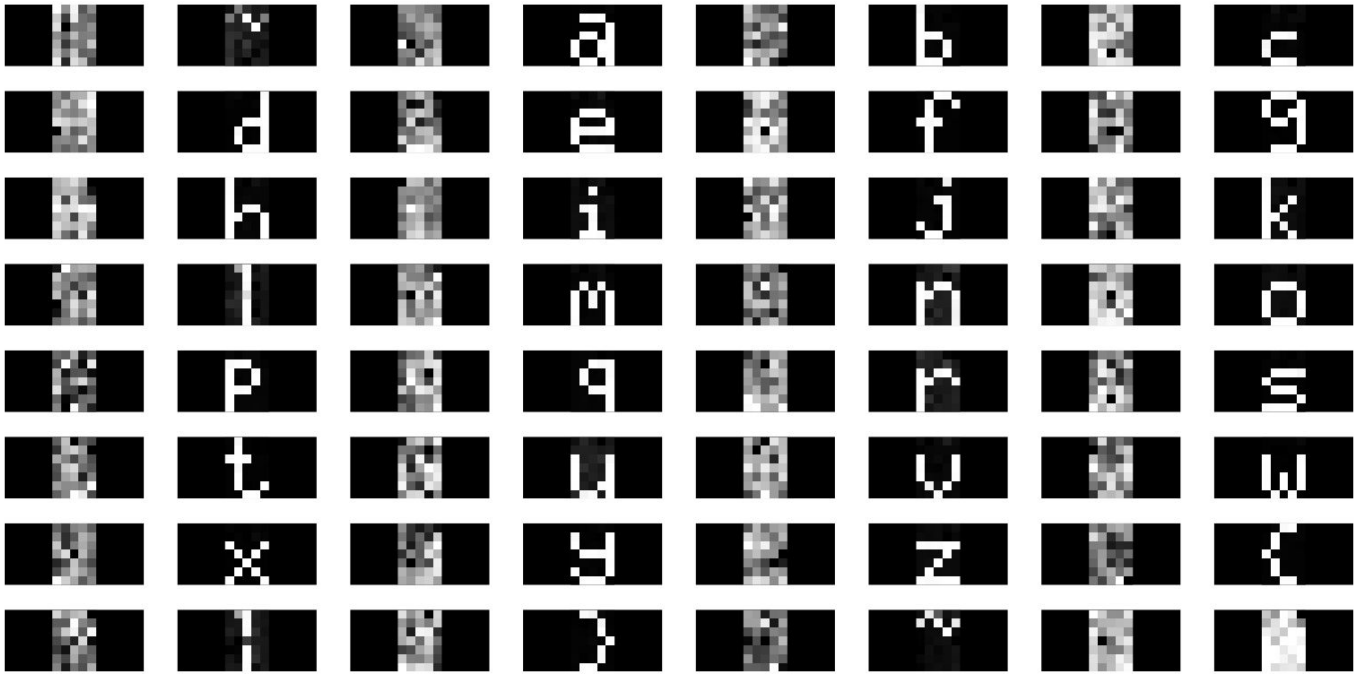
Variación de la cantidad de épocas

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]

Denoising AE

1 noise, 100k epochs

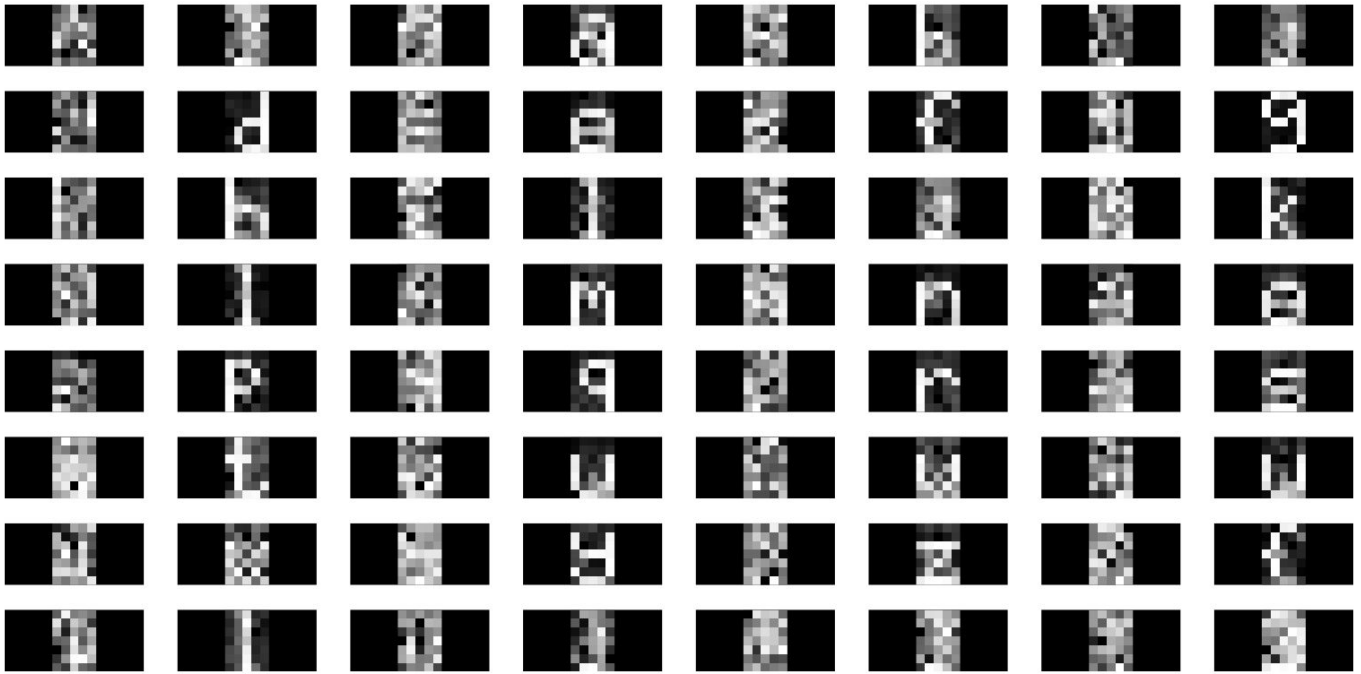
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Denoising AE

1 noise, 25k epochs

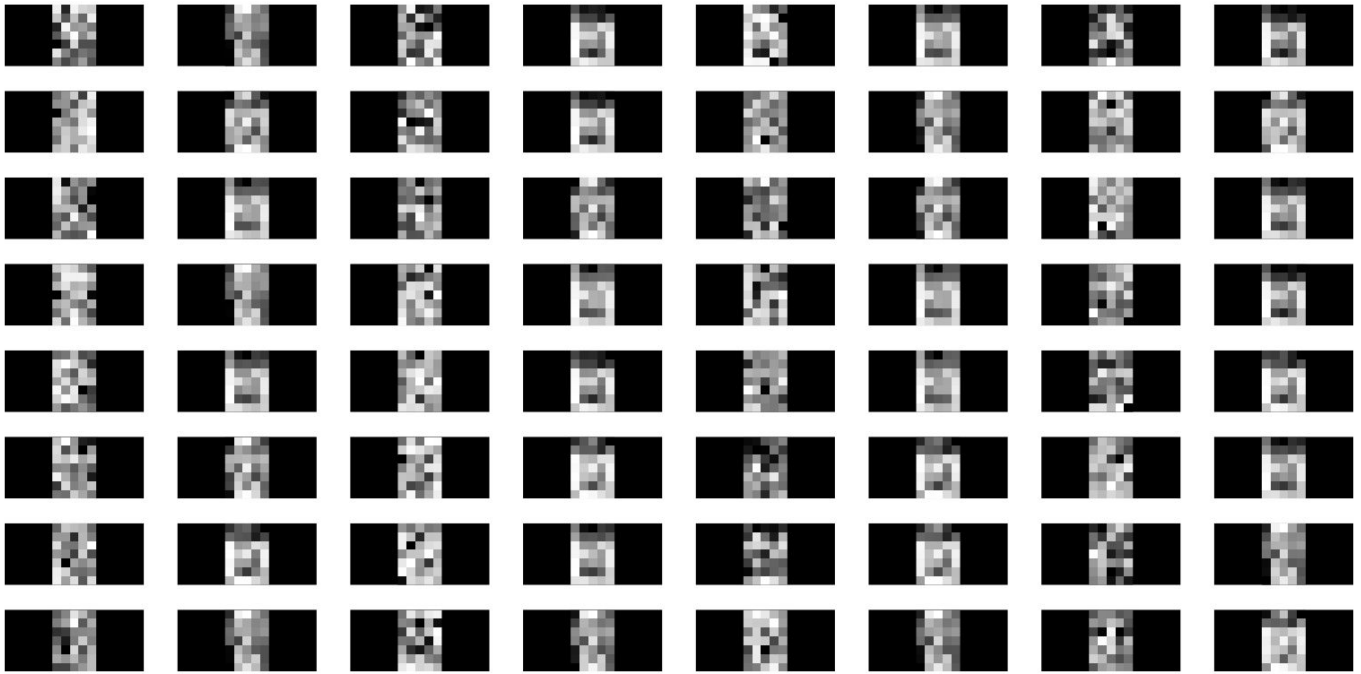
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Denoising AE

1 noise, 2k epochs

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



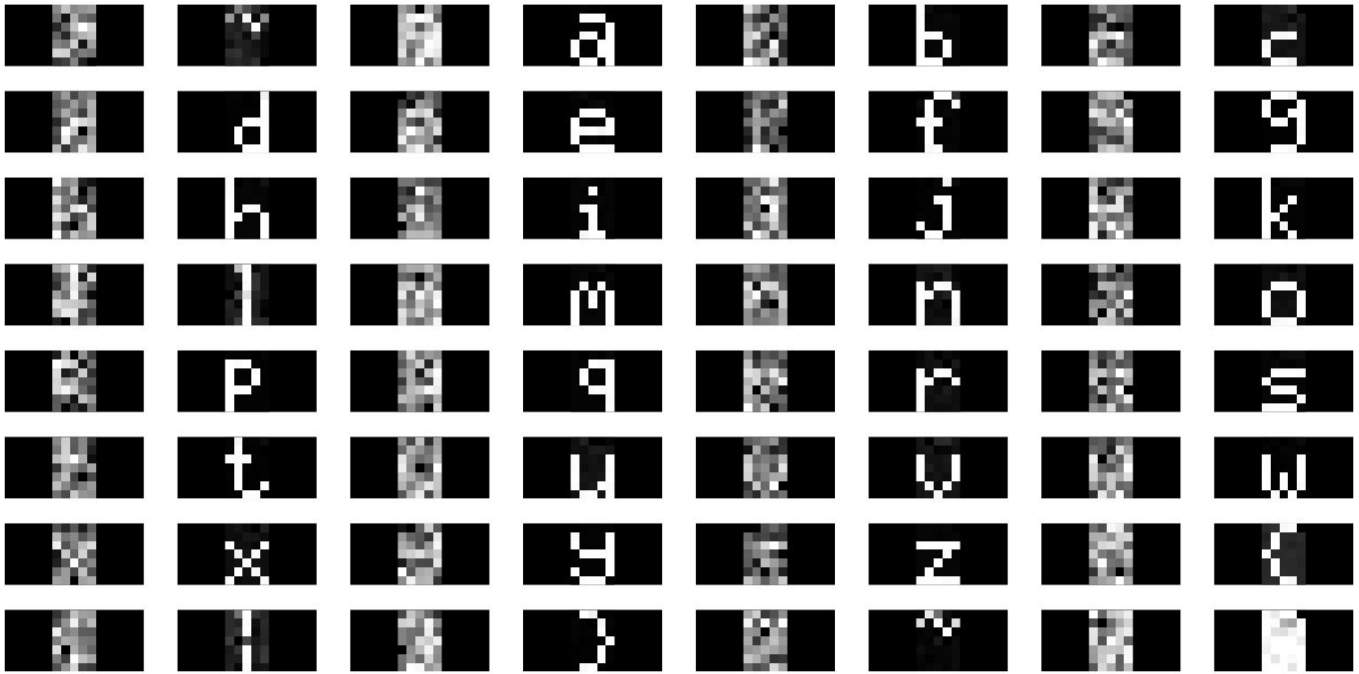
Variación del Learning Rate

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]

Denoising AE

1 noise, 100k epochs, 0.1 learning rate

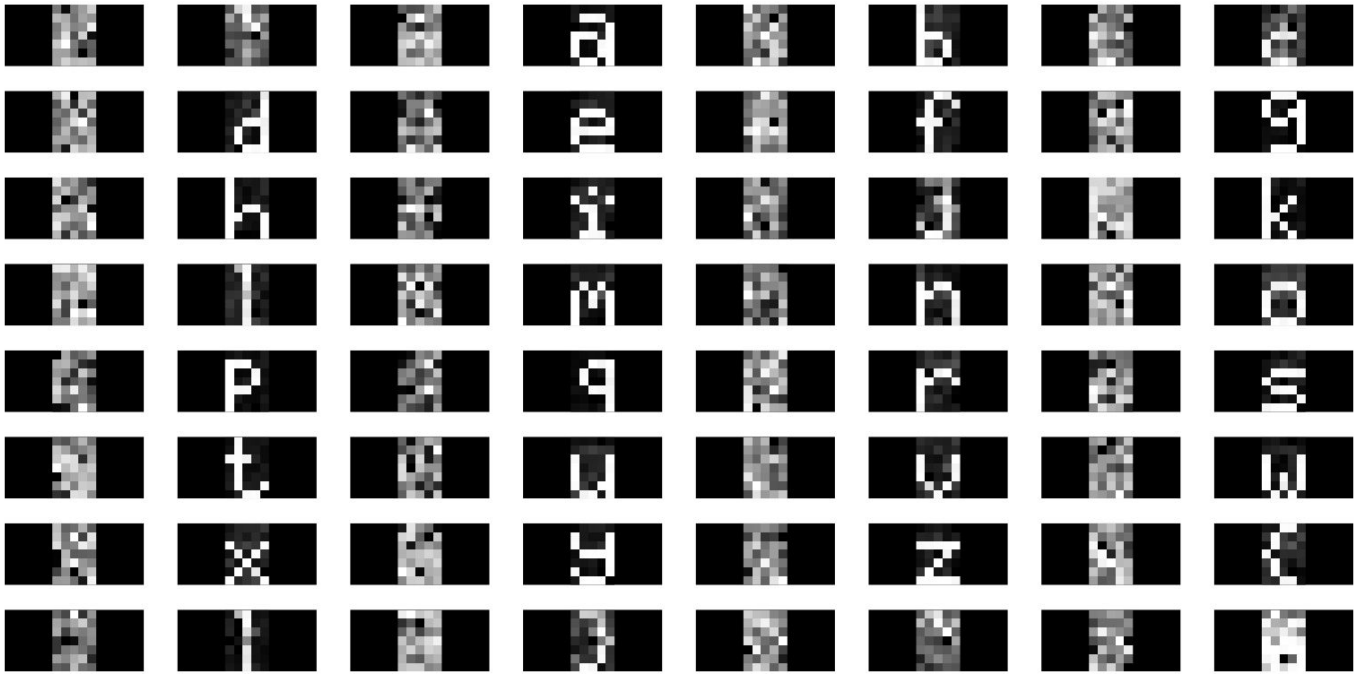
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Denoising AE

1 noise, 100k epochs, 0.01 learning rate

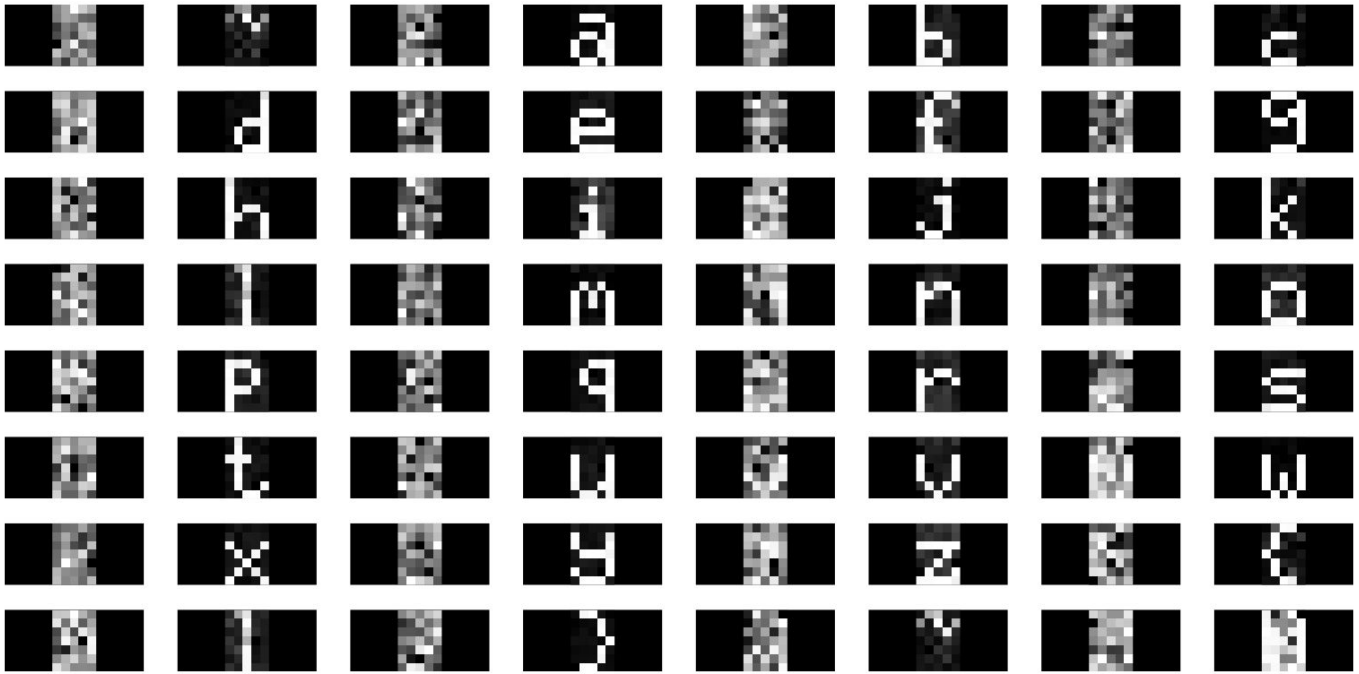
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Denoising AE

1 noise, 100k epochs, 0.001 learning rate

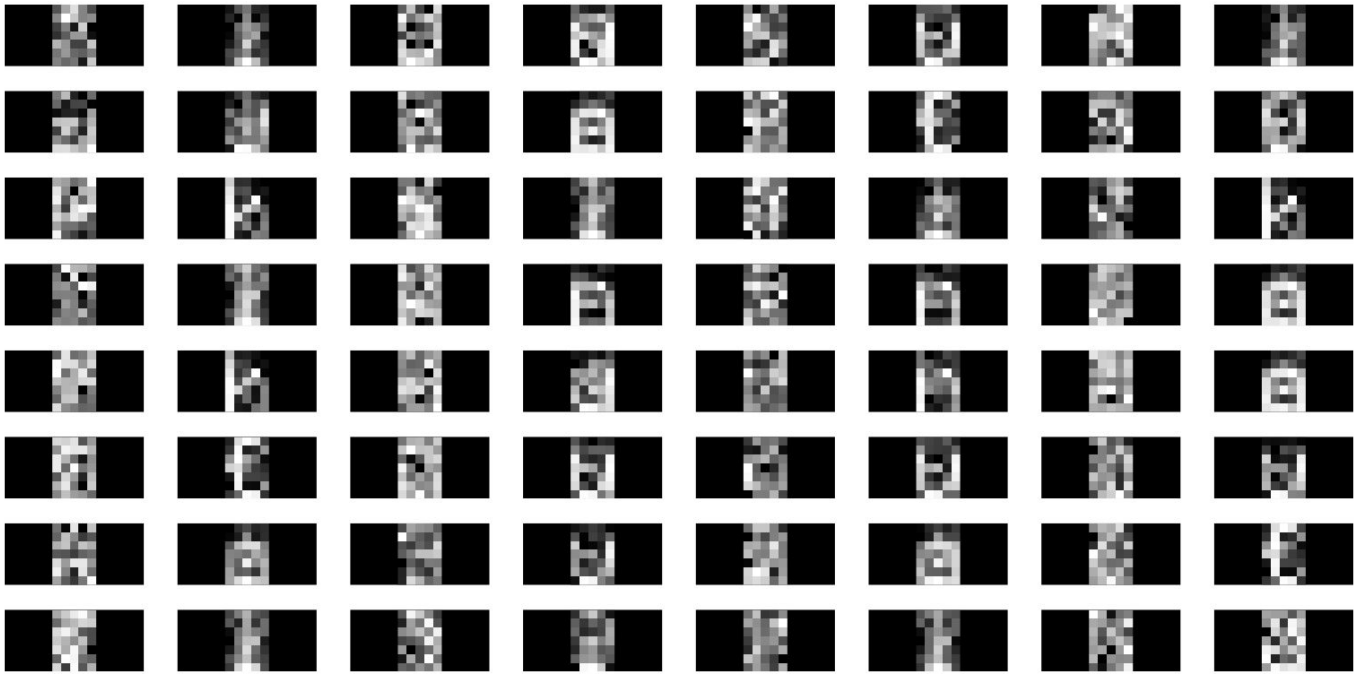
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



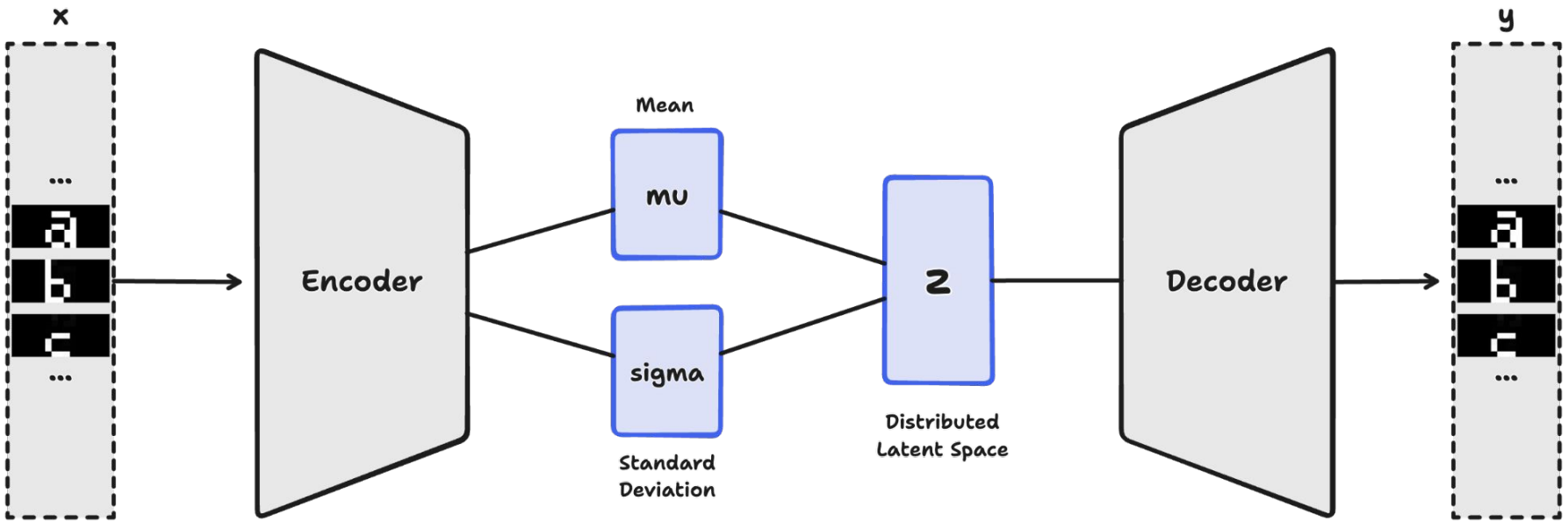
Denoising AE

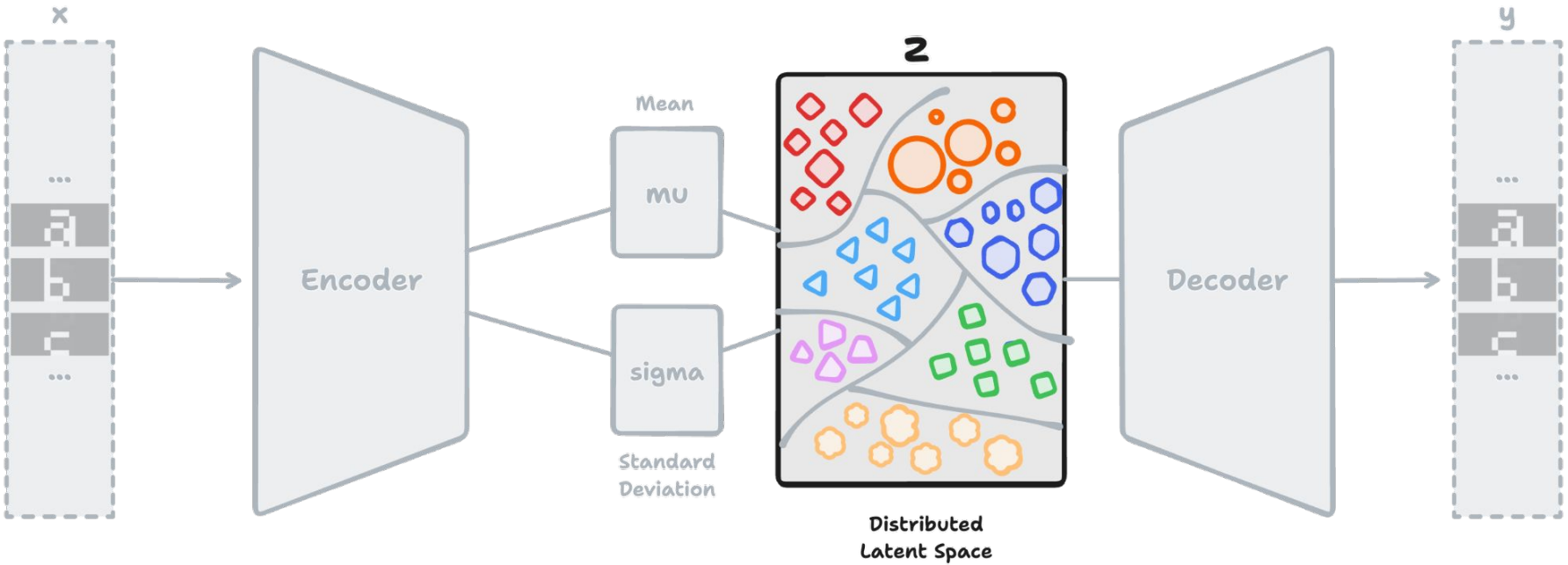
1 noise, 100k epochs, 0.0001 learning rate

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[35, 25, 25, 2, 25, 25, 35]
weights=[-1, 1]



Variational Autoencoders

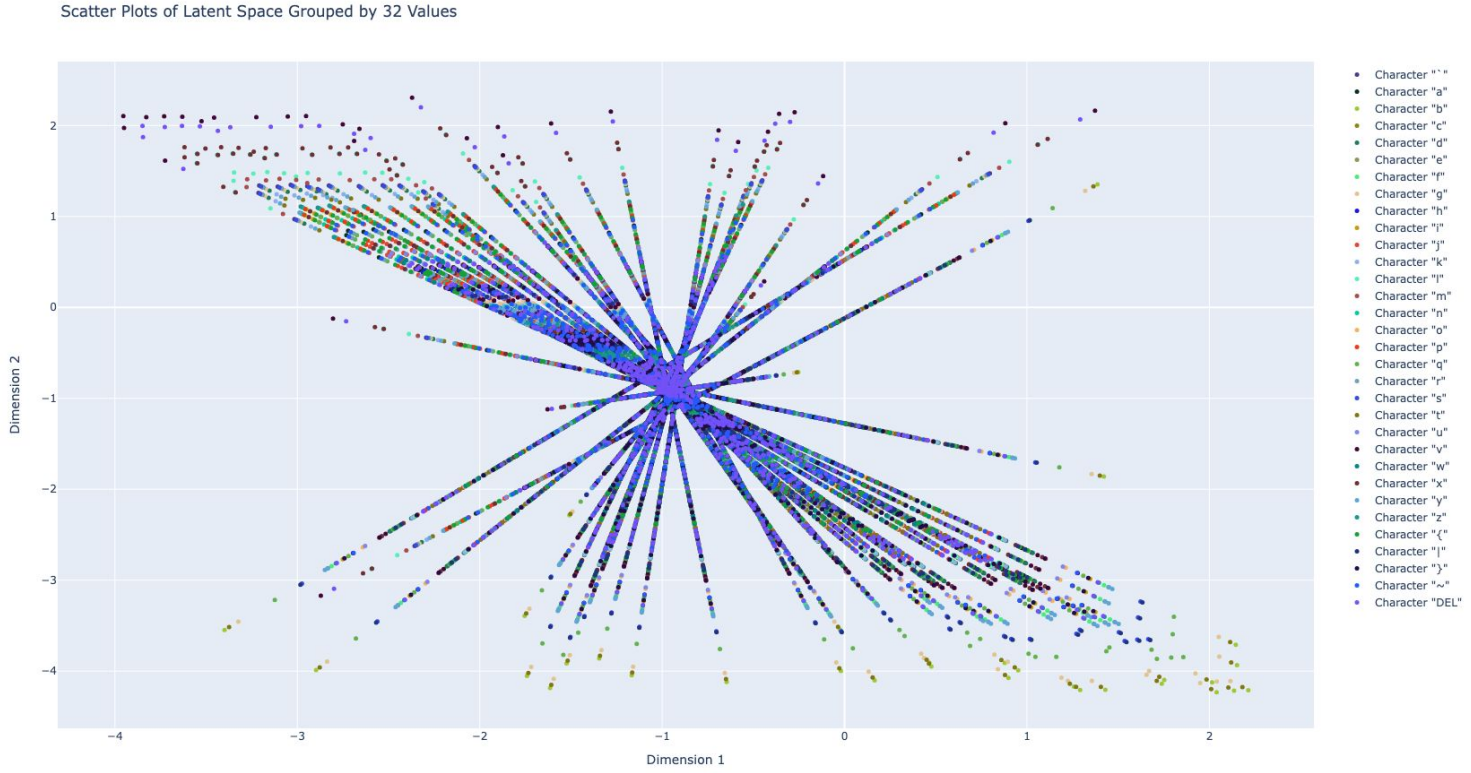

x
...
...
Encoder
Mean
mu
sigma
Standard
Deviation
z
Distributed
Latent Space
Decoder
y
...
...


x
...
...
Encoder
Mean
mu
sigma
Standard
Deviation
z
Distributed
Latent Space
Decoder
y
...
...

VAE: Espacio latente

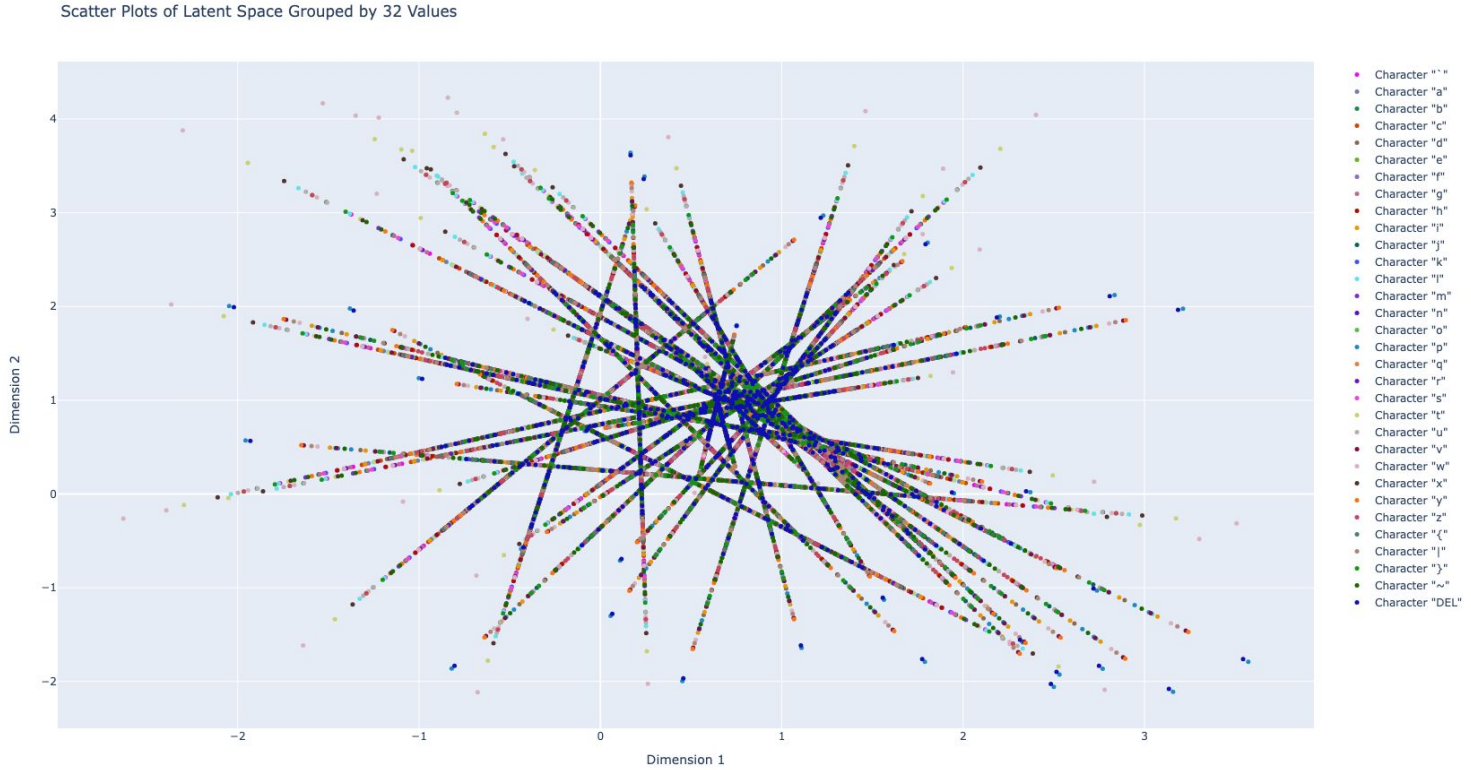
Variational AE

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 25, 5, 25, 25, 49]
weights=[-1,1]



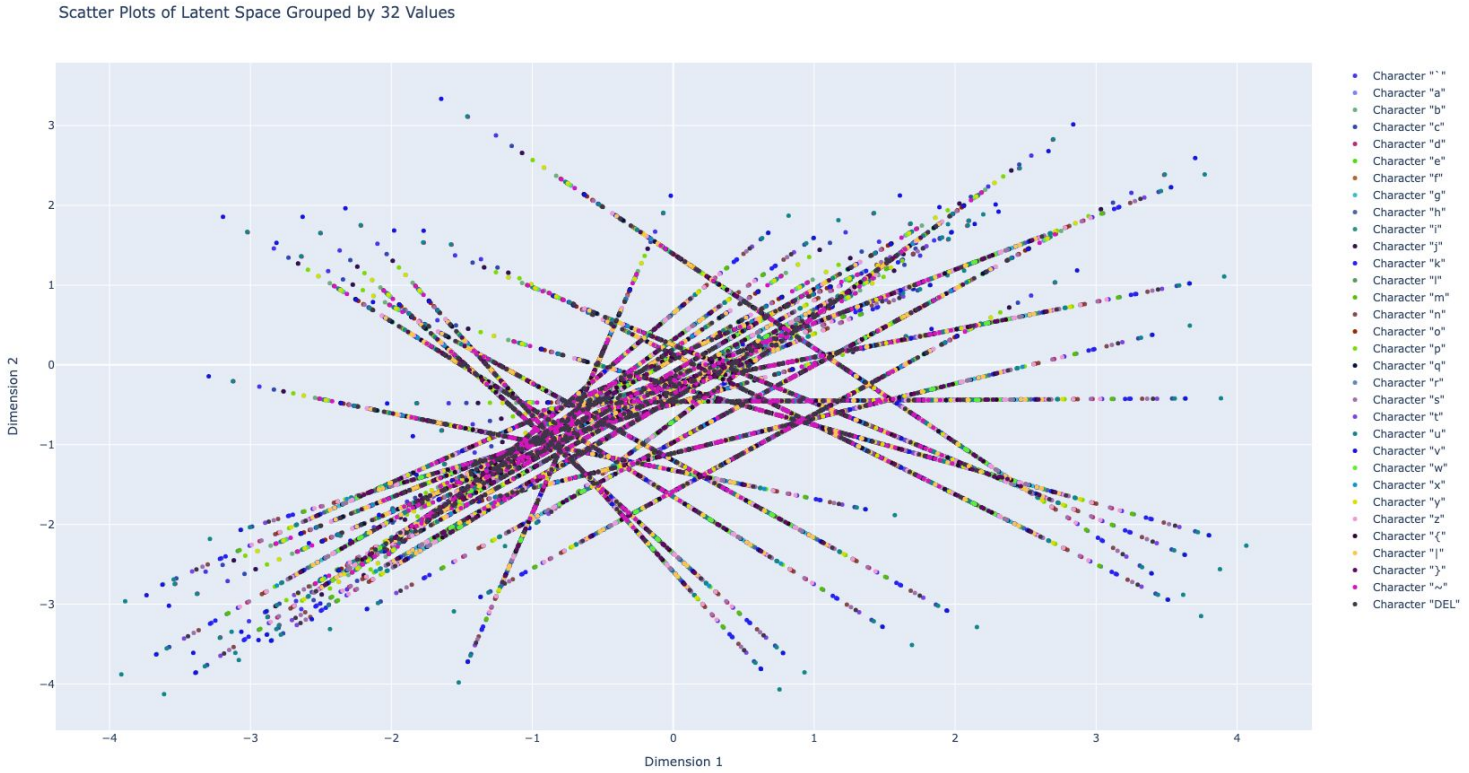
Variational AE

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 25, 5, 25, 25, 49]
weights=[-1,1]

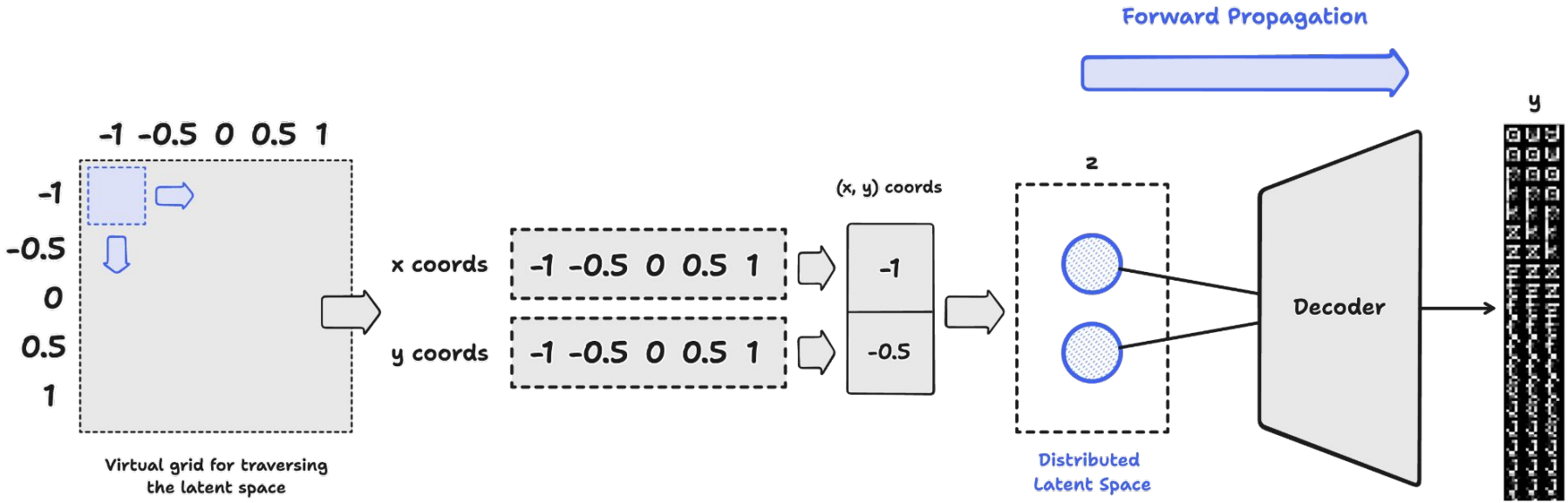


Variational AE

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 25, 5, 25, 25, 49]
weights=[-1,1]



VAE: Conjunto de datos

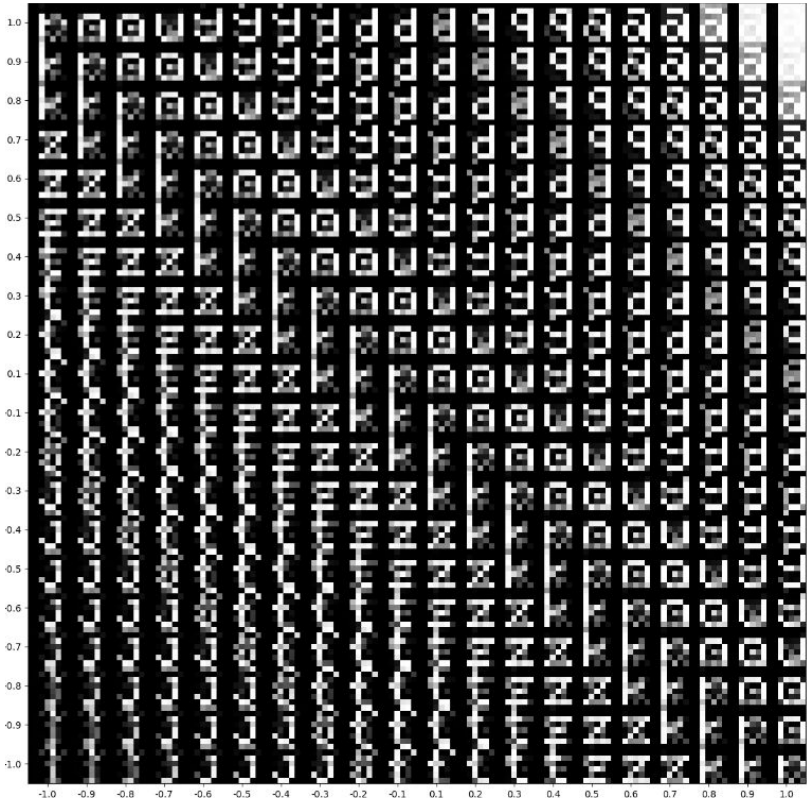

Forward Propagation
-1 -0.5 0 0.5 1
-1
-0.5
0
0.5
1
Virtual grid for traversing the latent space
x coords
y coords
-1 -0.5 0 0.5 1
-1 -0.5 0 0.5 1
(x, y) coords
-1
-0.5
z
Distributed Latent Space
Decoder
y

Entrenamiento con letras

Variational AE

15k epochs

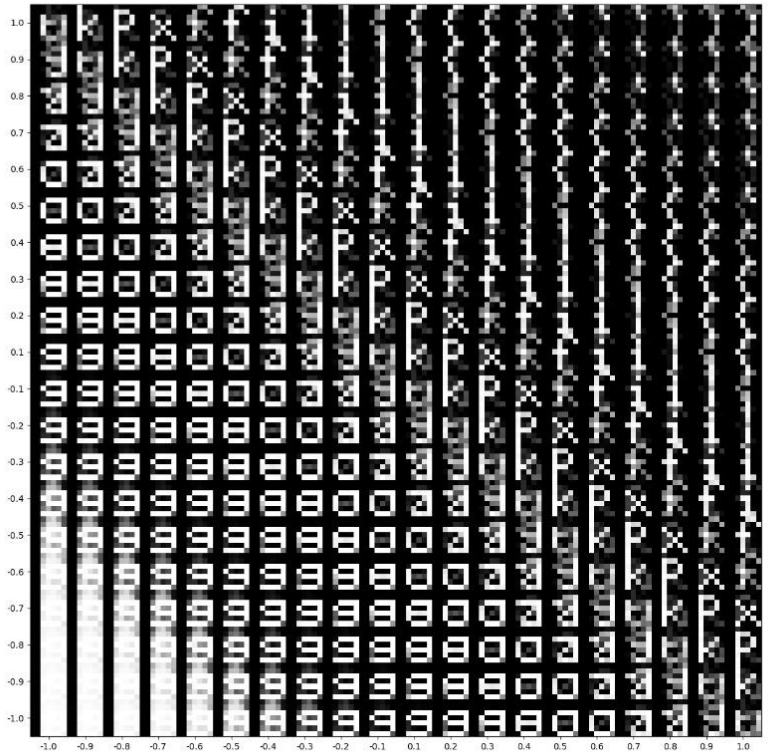
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 10, 2, 10, 25, 49]
weights=[-1, 1]



Variational AE

15k epochs

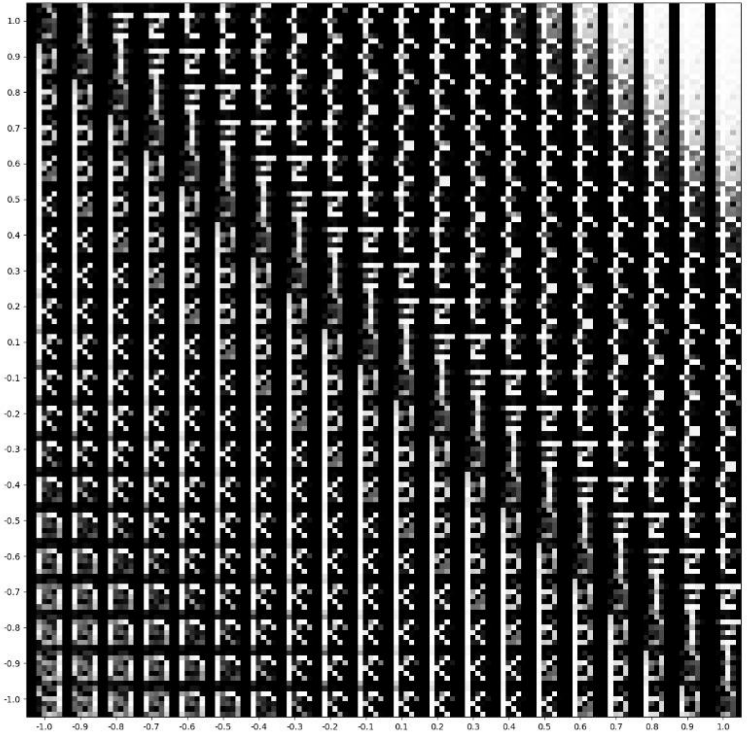
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 10, 2, 10, 25, 49]
weights=[-1, 1]



Variational AE

15k epochs

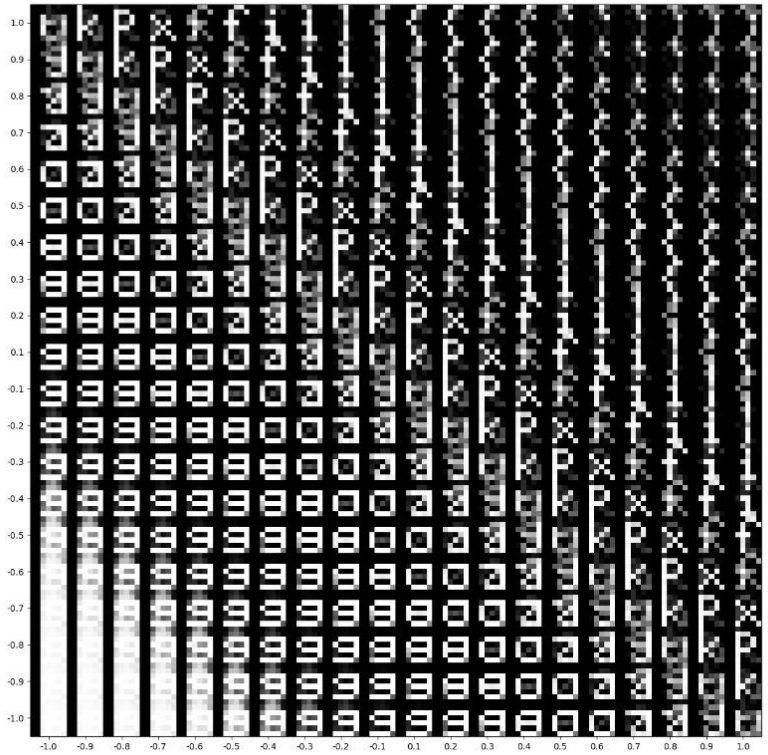
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 10, 2, 10, 25, 49]
weights=[-1, 1]



Variational AE

15k epochs

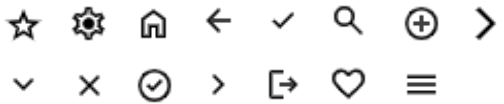
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[49, 25, 10, 2, 10, 25, 49]
weights=[-1, 1]



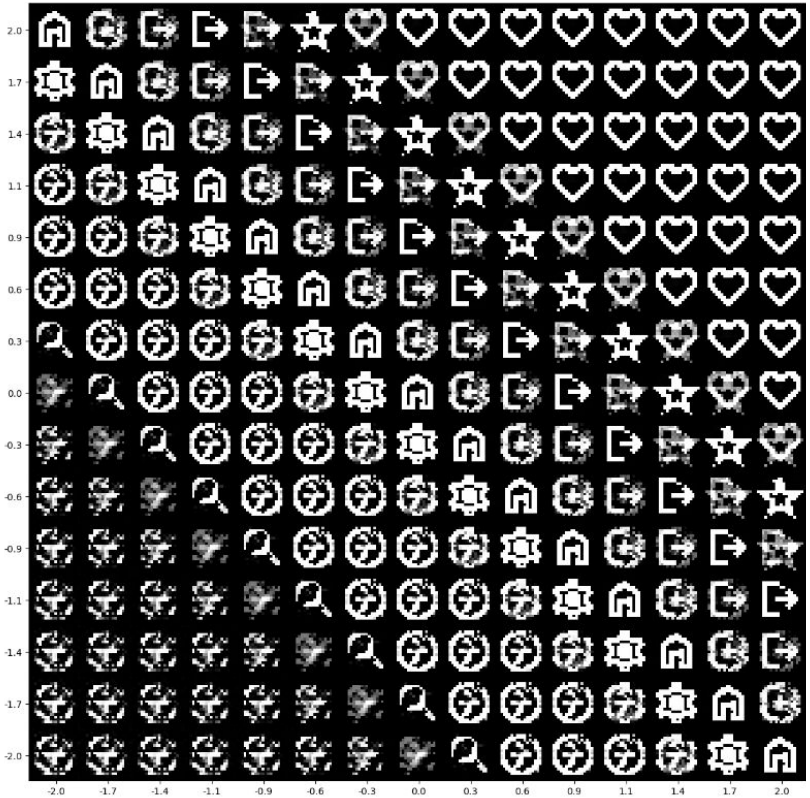
Entrenamiento con Iconos

Variational AE

8k epochs, 15 samples [-2, 2]



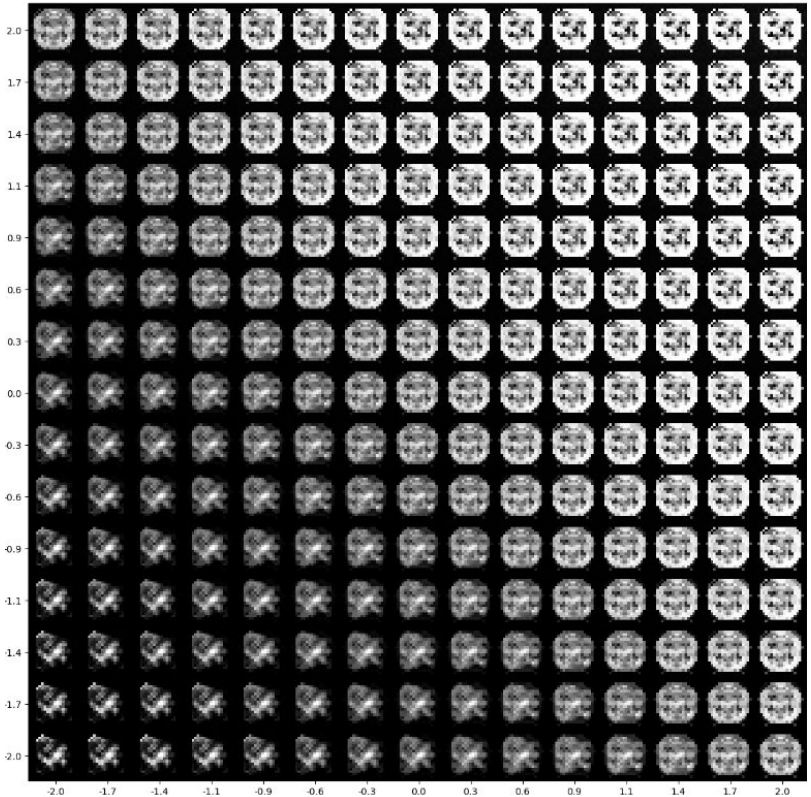
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 100, 20, 2, 20, 100, 400]
weights=[-1, 1]



Variational AE

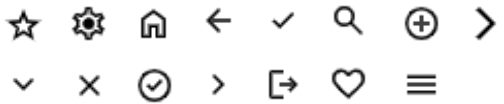
8k epochs, 15 samples [-1, 1]

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 2, 400]
weights=[-1, 1]

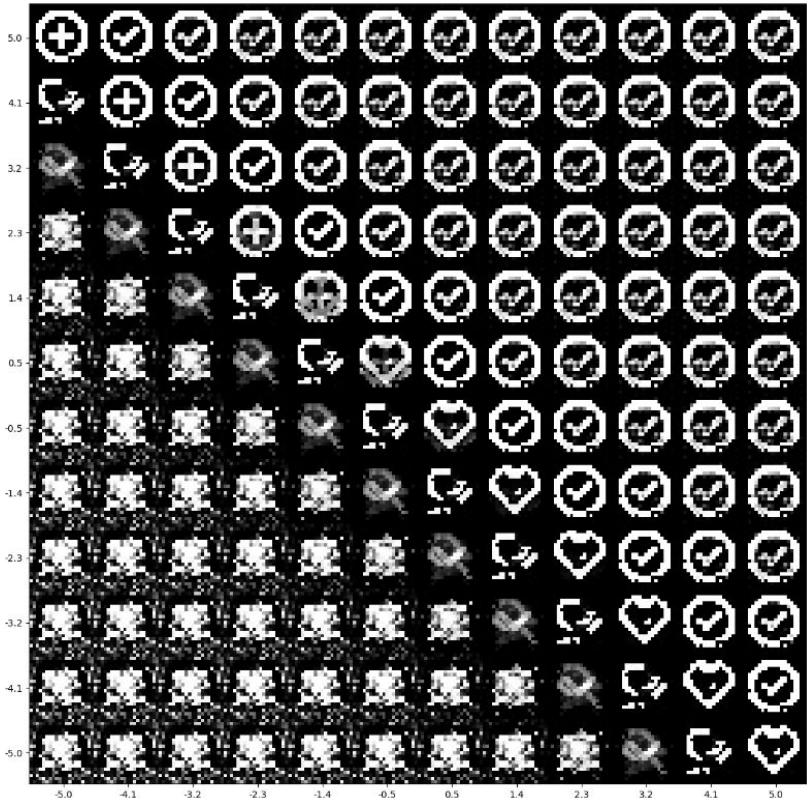


Variational AE

8k epochs, 12 samples [-5, 5]

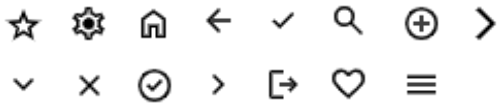


activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 100, 2, 100, 400]
weights=[-1, 1]

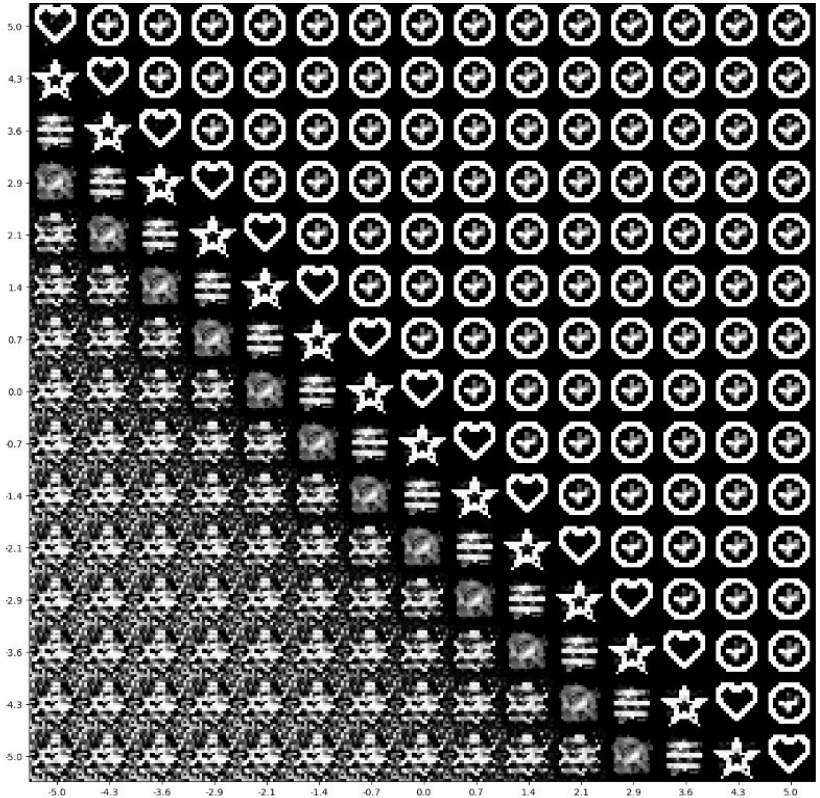


Variational AE

8k epochs, 15 samples [-5, 5]

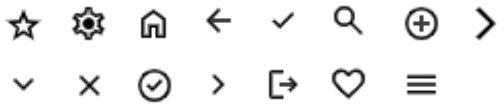


activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 80, 10, 80, 400]
weights=[-1, 1]

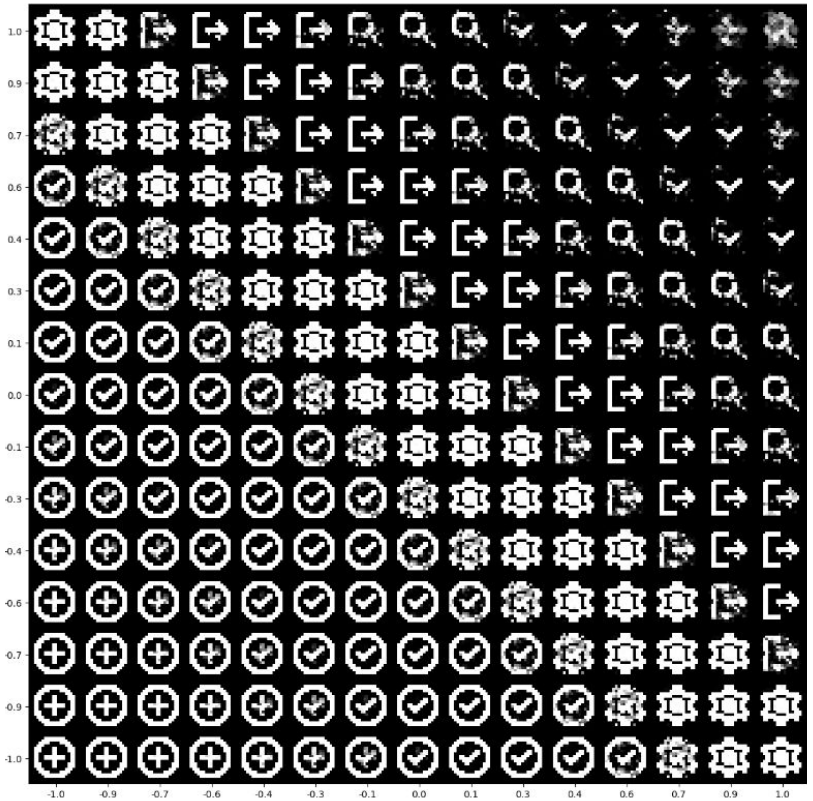


Variational AE

8k epochs, 15 samples [-1, 1]



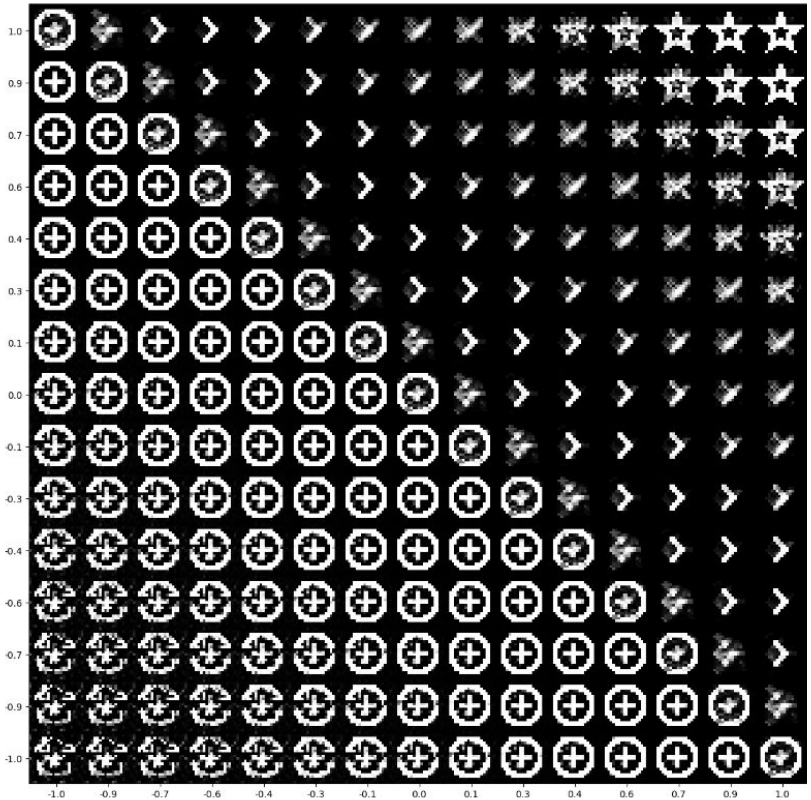
activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 150, 15, 2, 15, 150, 400]
weights=[-1, 1]



Variational AE

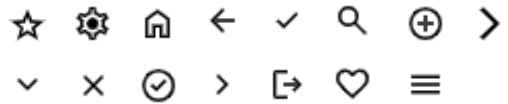
8k epochs, 15 samples [-1, 1]

activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 150, 10, 2, 10, 150, 400]
weights=[-1, 1]

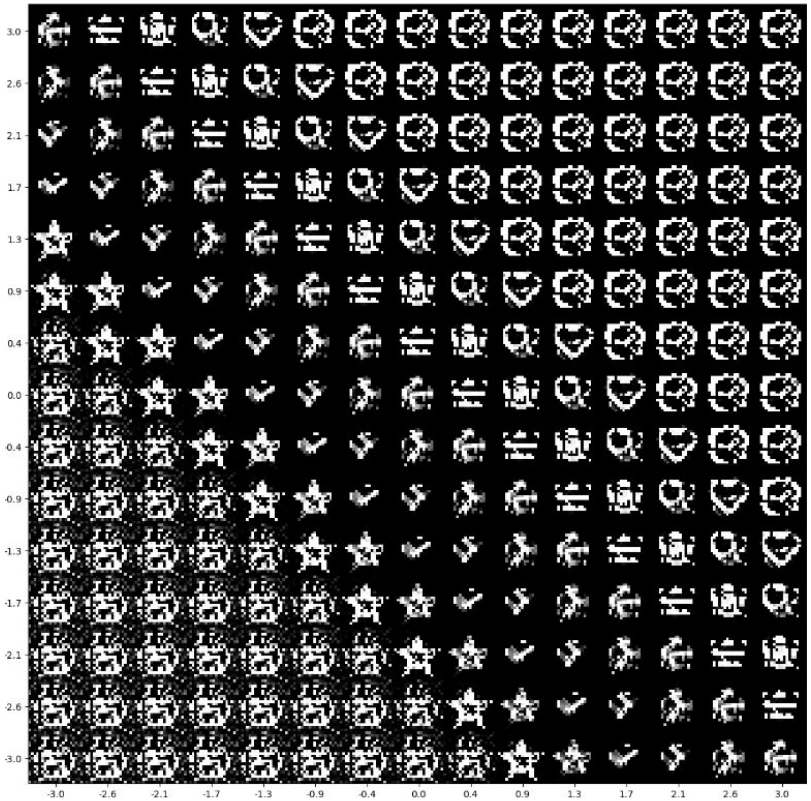


Variational AE

8k epochs, 15 samples [-3, 3]

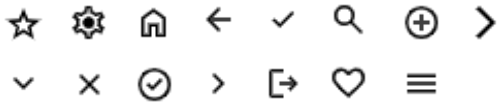


activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 150, 10, 2, 10, 150, 400]
weights=[-1, 1]

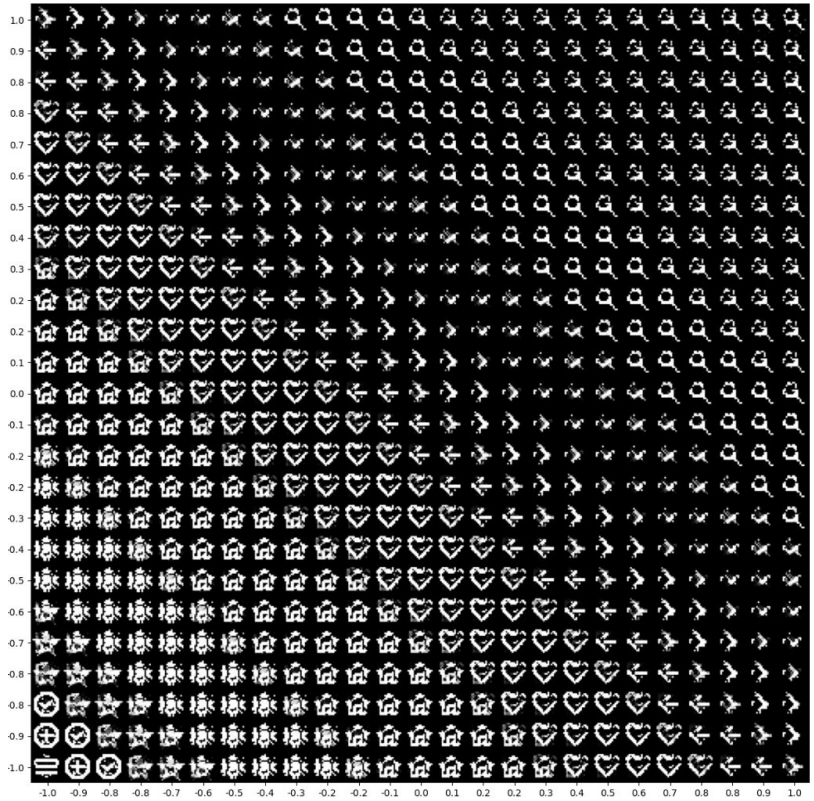


Variational AE

8k epochs, 25 samples [-1, 1]



activation=TAN_H,
activation_prime=TAN_H_DERIVATIVE,
optimizer=Adam,
architecture=[400, 150, 20, 2, 20, 150, 400]
weights=[-1, 1]



¡Muchas gracias!

Integrantes:

- Nicolás Matías Margenat, 62028
- Martín Hecht, 62041
- Juan Burda, 62094
- Lautaro Hernando, 62329
- Saul Ariel Castañeda, 62493
- Elian Paredes, 62504