Autoencoder

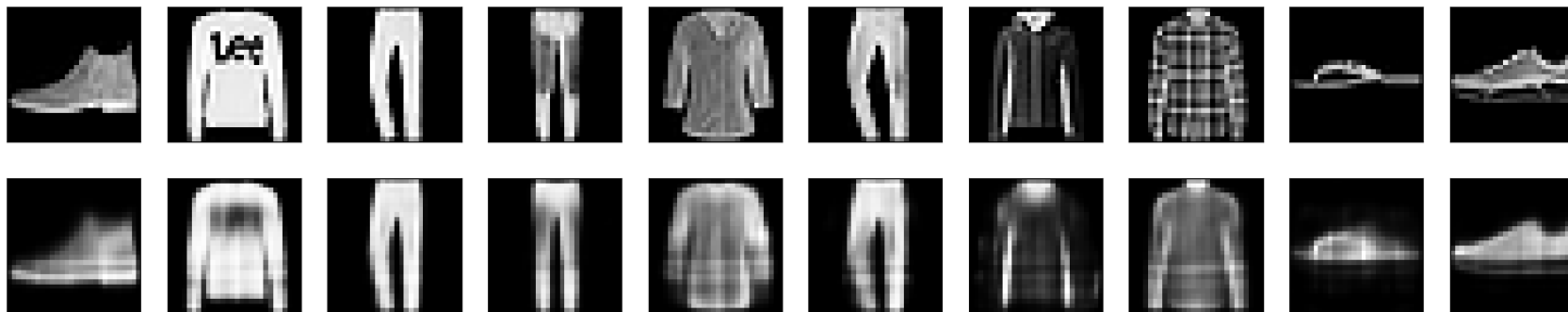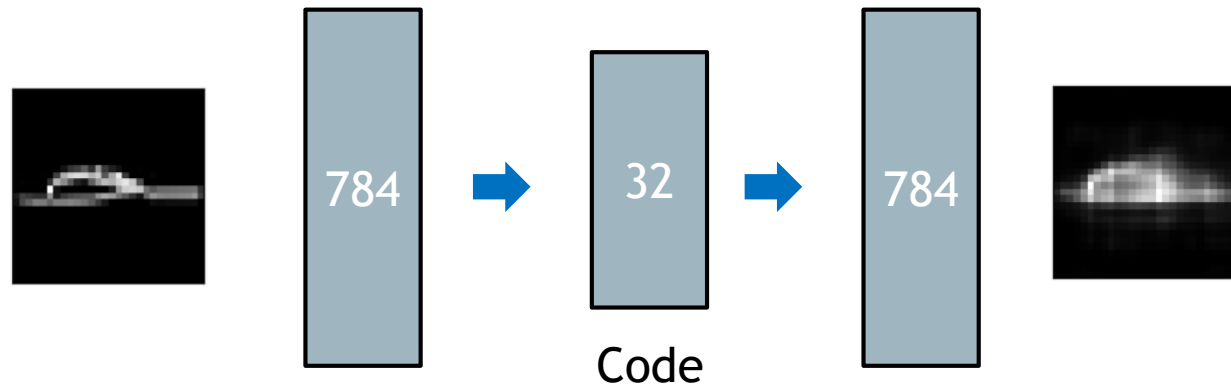# Outline

- Simple autoenocder, deep autoencoder and convolutional autoencoder

- Two dimensional code visualization

- Generate new image with decoder

- Classify image with encoder

Outline

▶ Simple autoenocder, deep autoencoder and convolutional autoencoder

▶ Two dimensional code visualization

▶ Generate new image with decoder

▶ Classify image with encoder

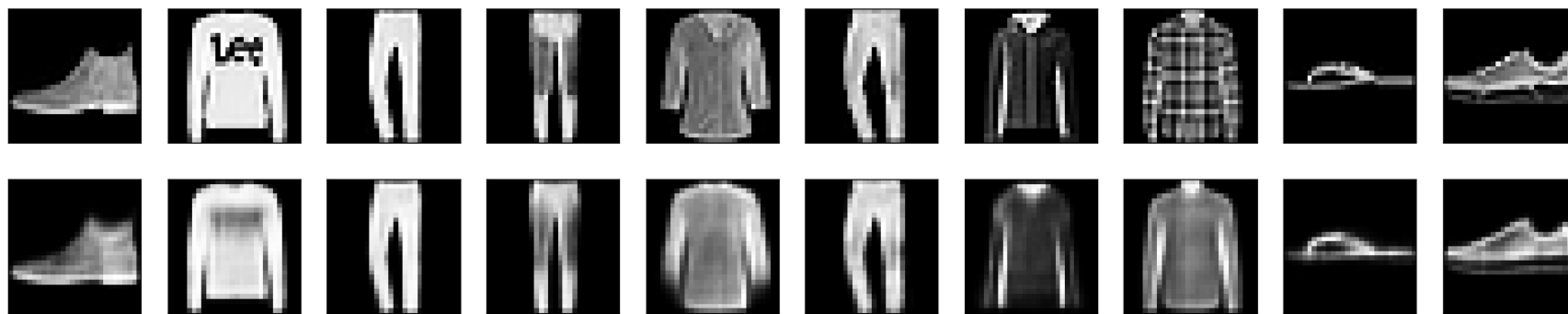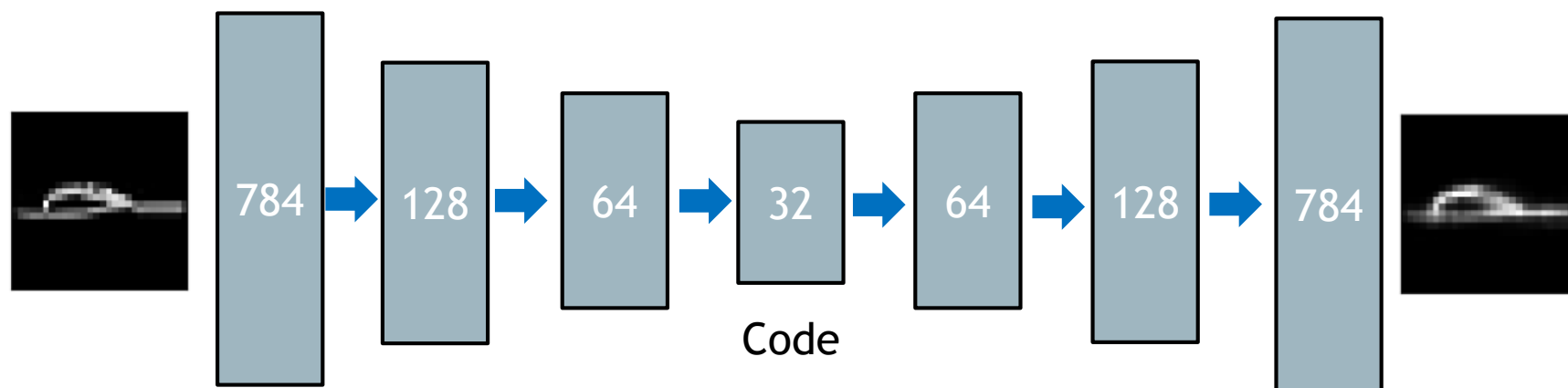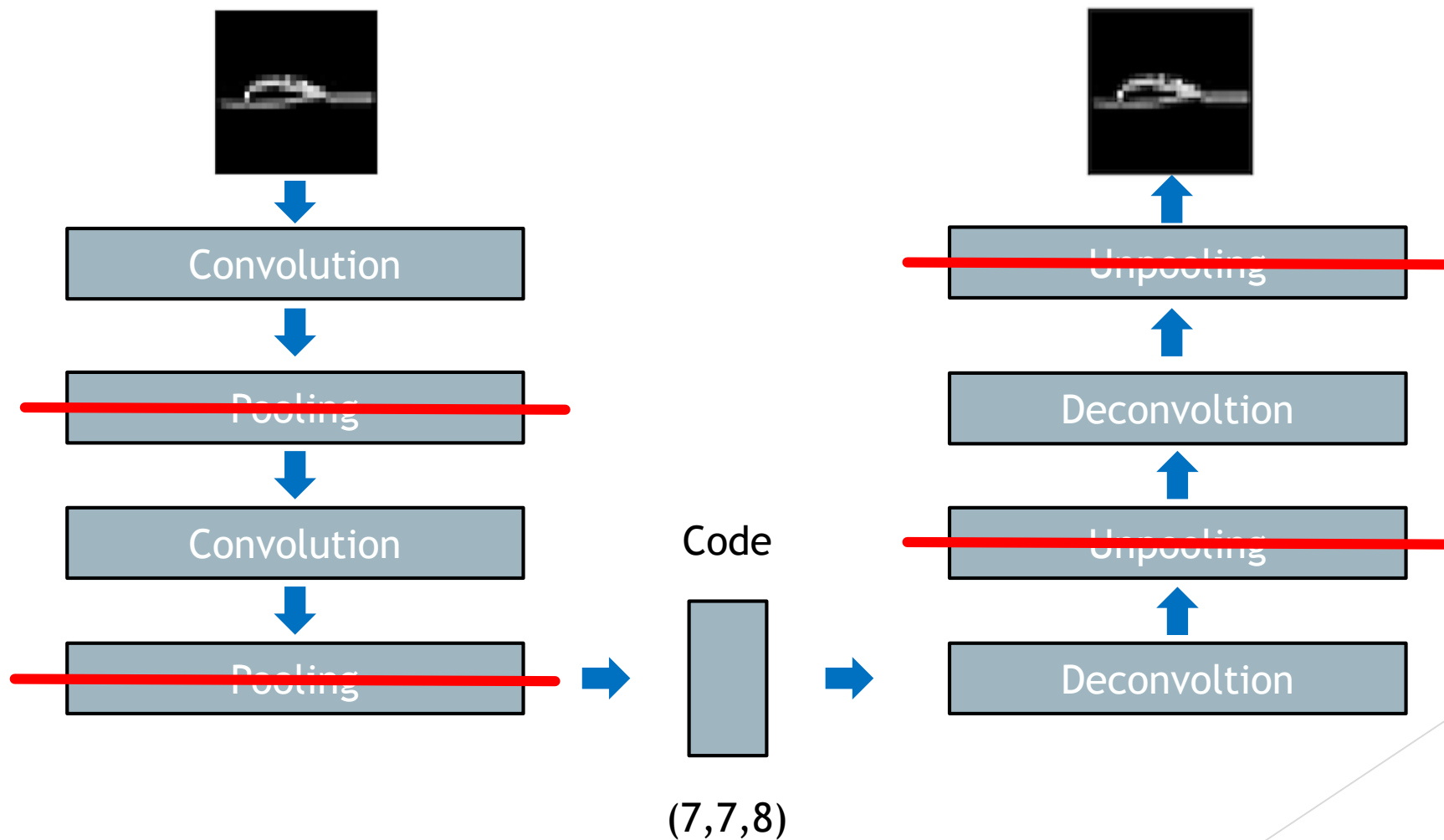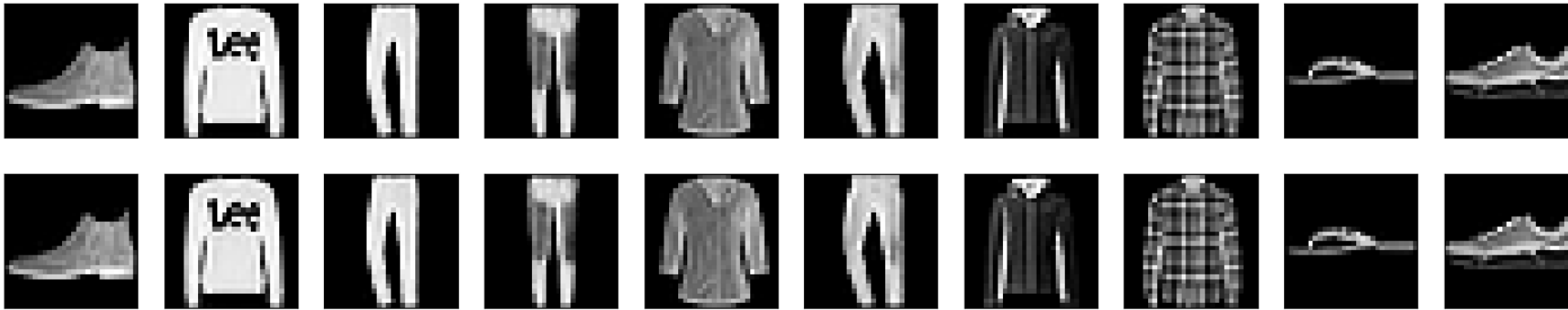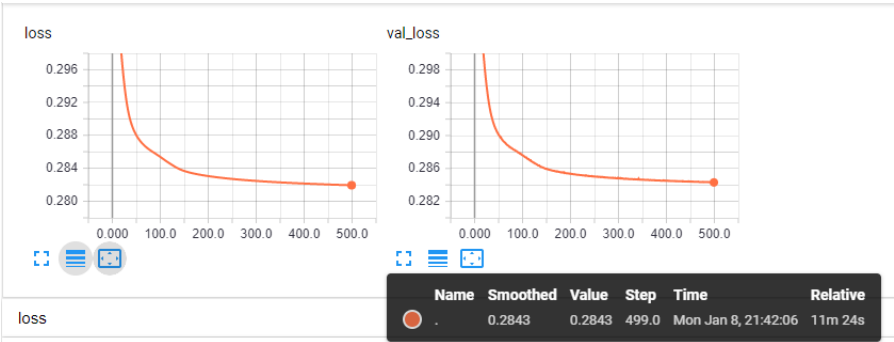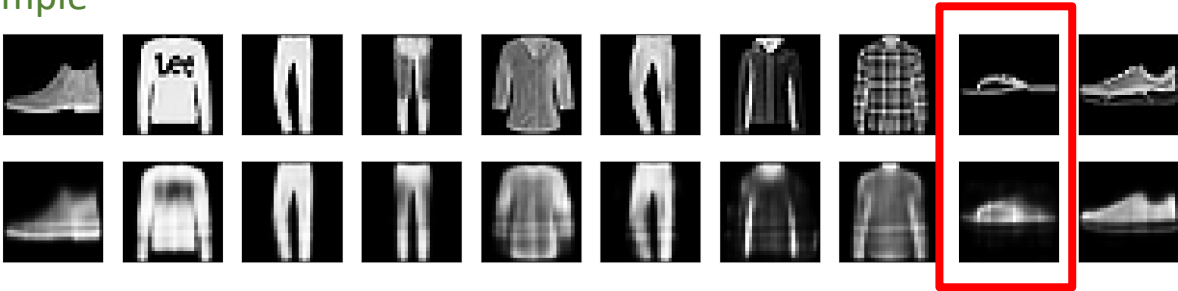# Simple Autoencoder(hw6)

Deep Autoencoder

Convolutional Autoencoder

Convolution

Pooling

Convolution

Pooling

Code

(7,7,8)

Deconvoltion
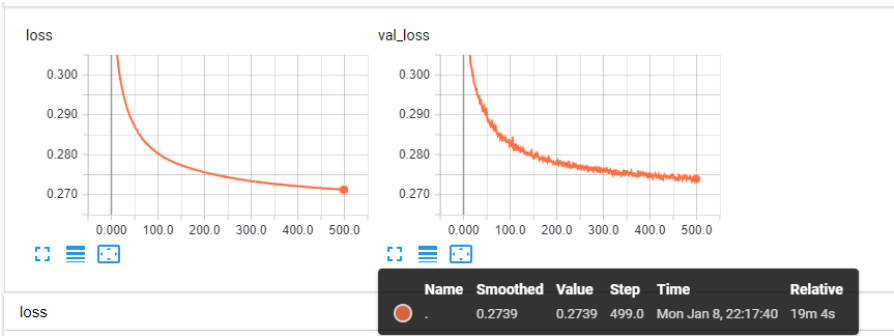
Unpooling

Deconvoltion

Unpooling
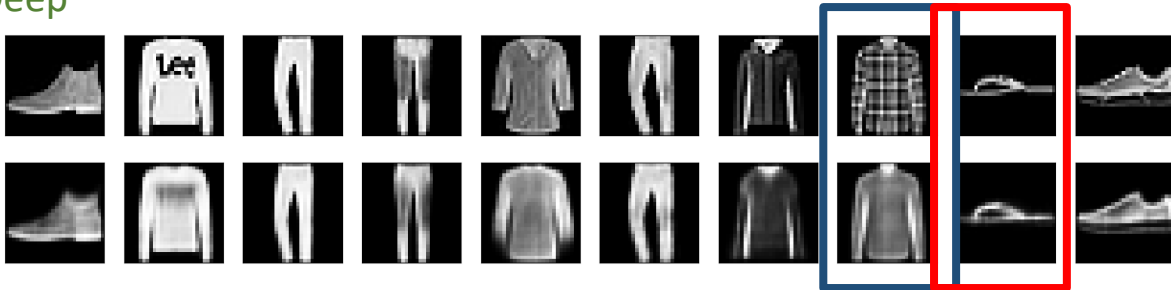
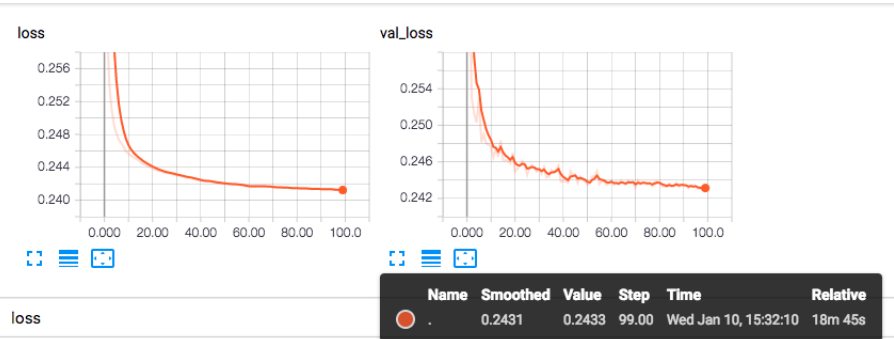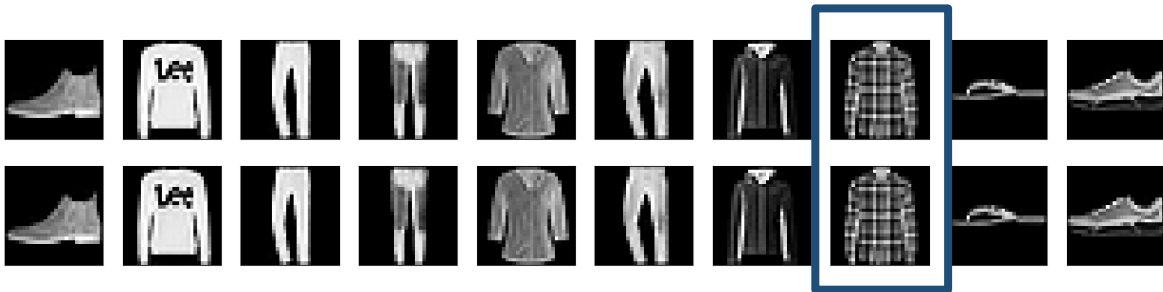# Convolutional Autoencoder(Cont.)

Simple

Val_loss

0.2843

Deep

0.2739

Best

Convolutional

0.2431

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- Simple autoenocder, deep autoencoder and convolutional autoencoder

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Visualization

Visualization(Cont.)

1 epoch

10 epoch

100 epoch
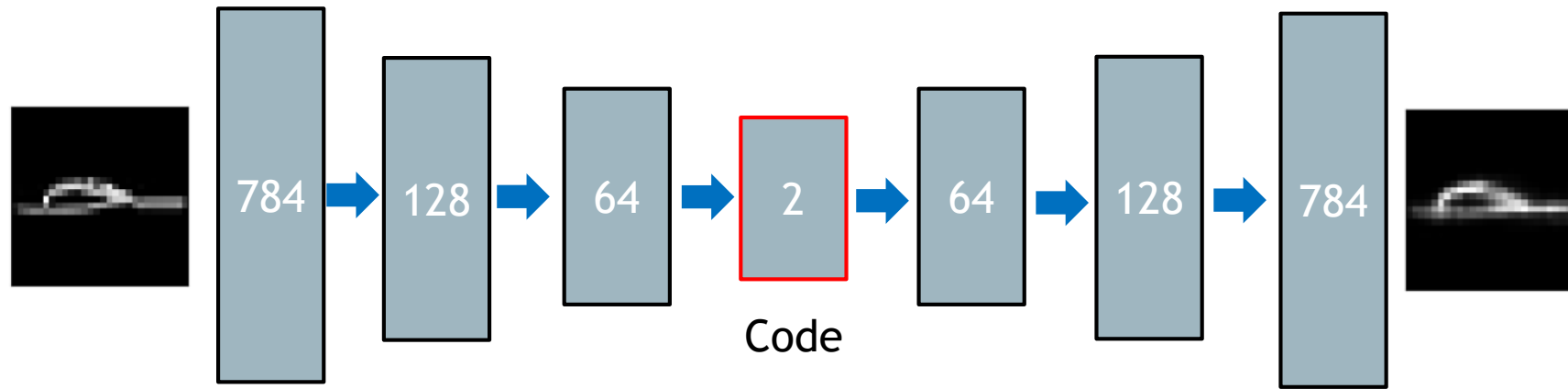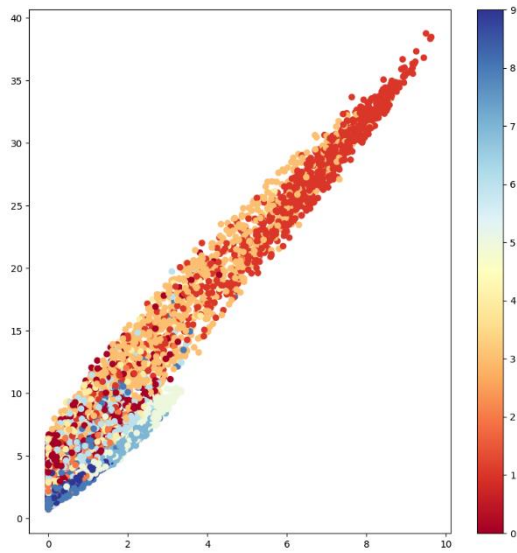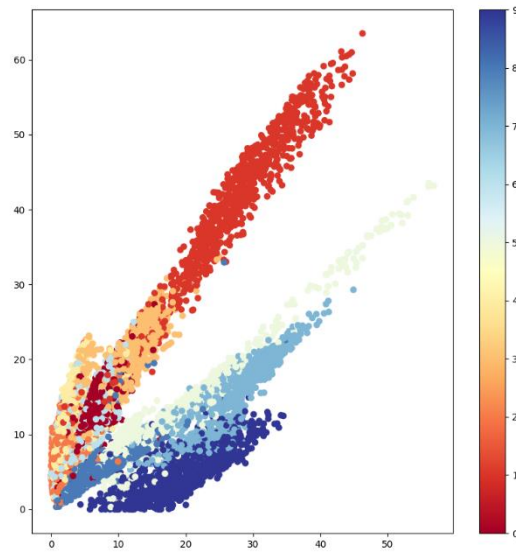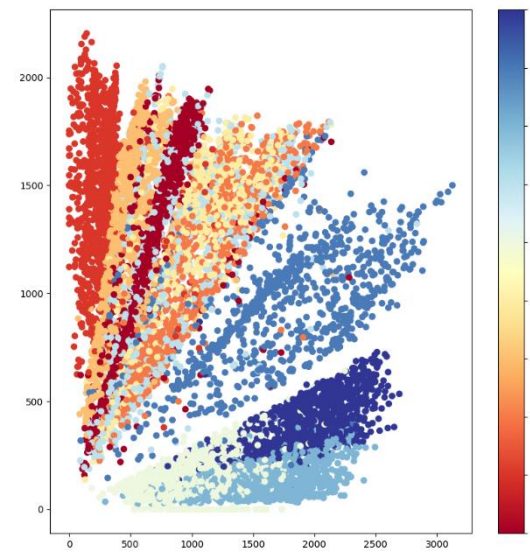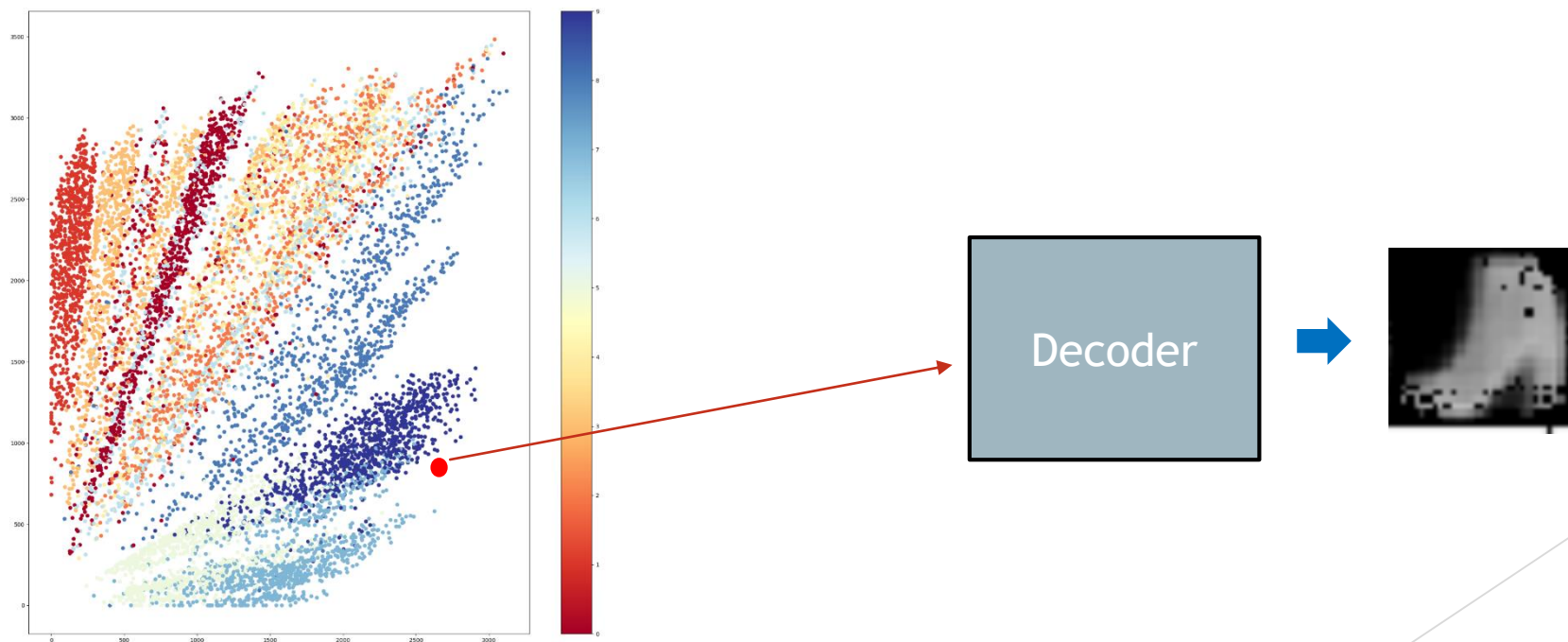
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Use decoder to generate new image
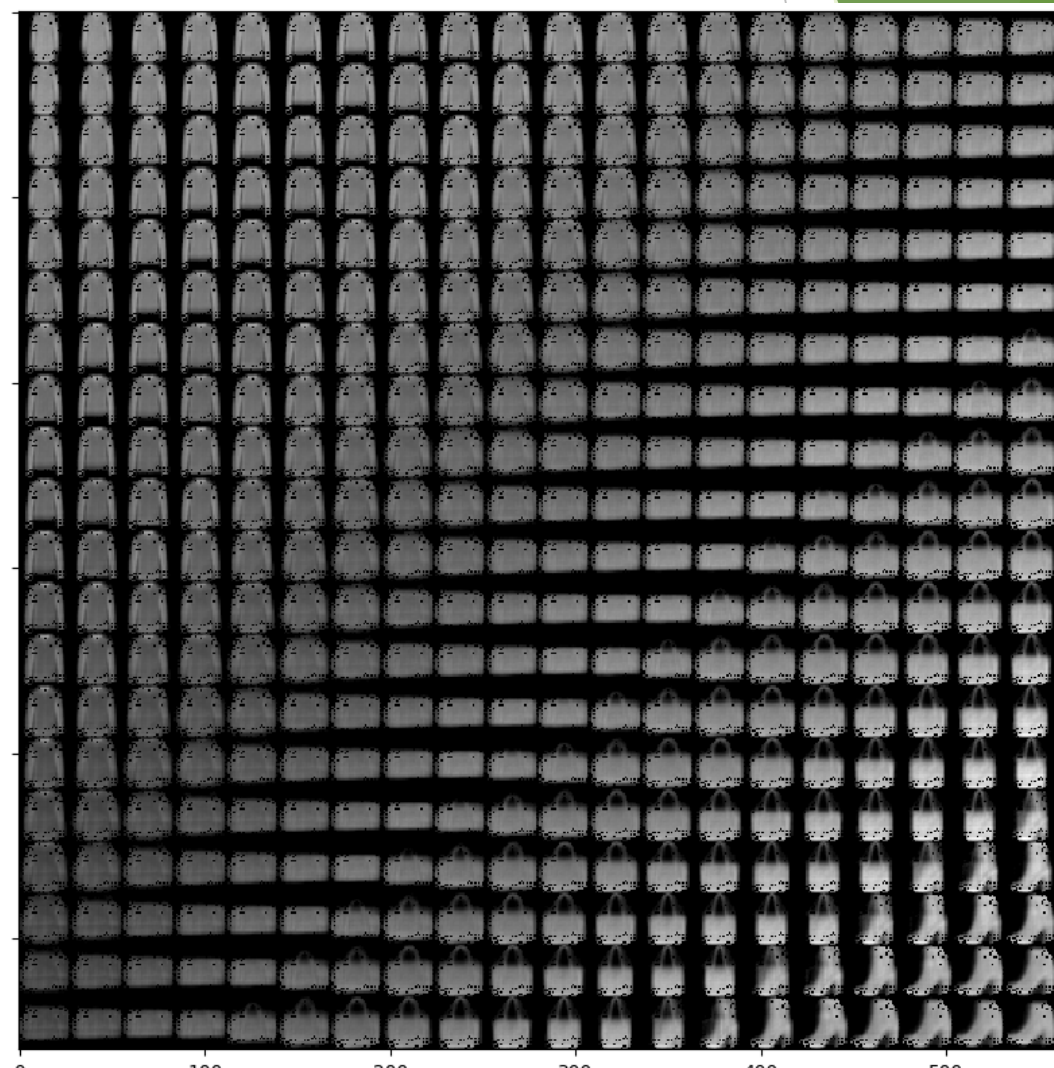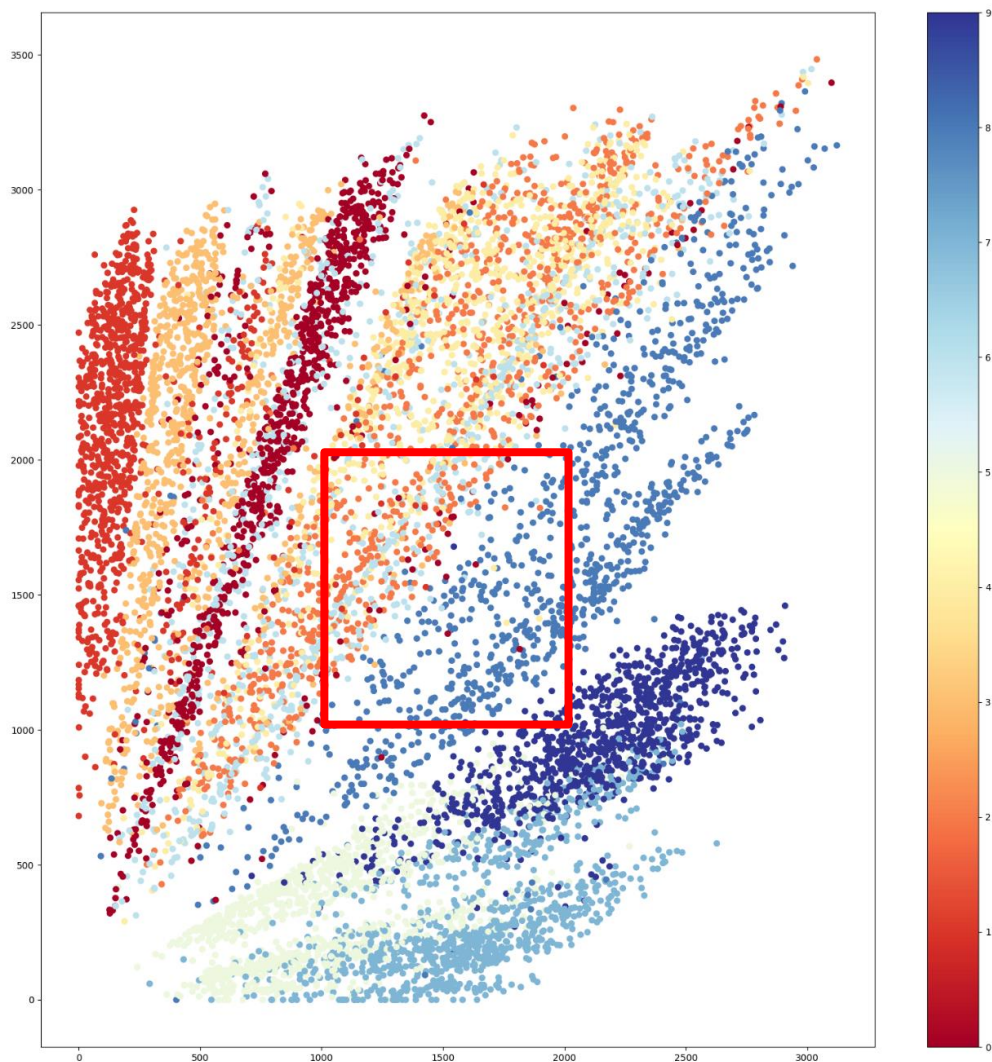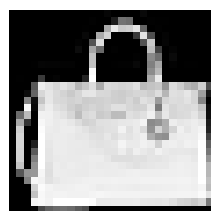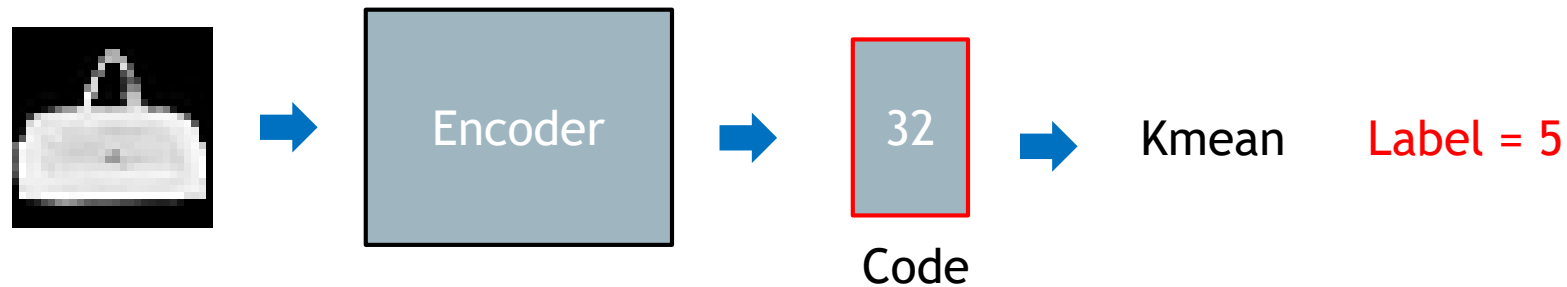
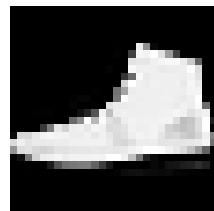# Use decoder to generate new image(Cont.)

Outline

▶ Simple autoenocder, deep autoencoder and convolutional autoencoder

▶ Two dimensional code visualization

▶ Generate new image with decoder

▶ Classify image with encoder

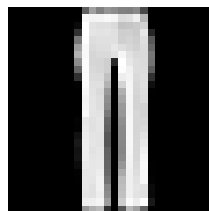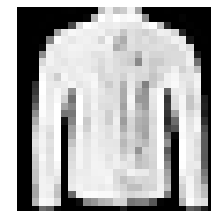# Use encoder to classify image

Encoder → 32 (Code) → Kmean   Label = 5
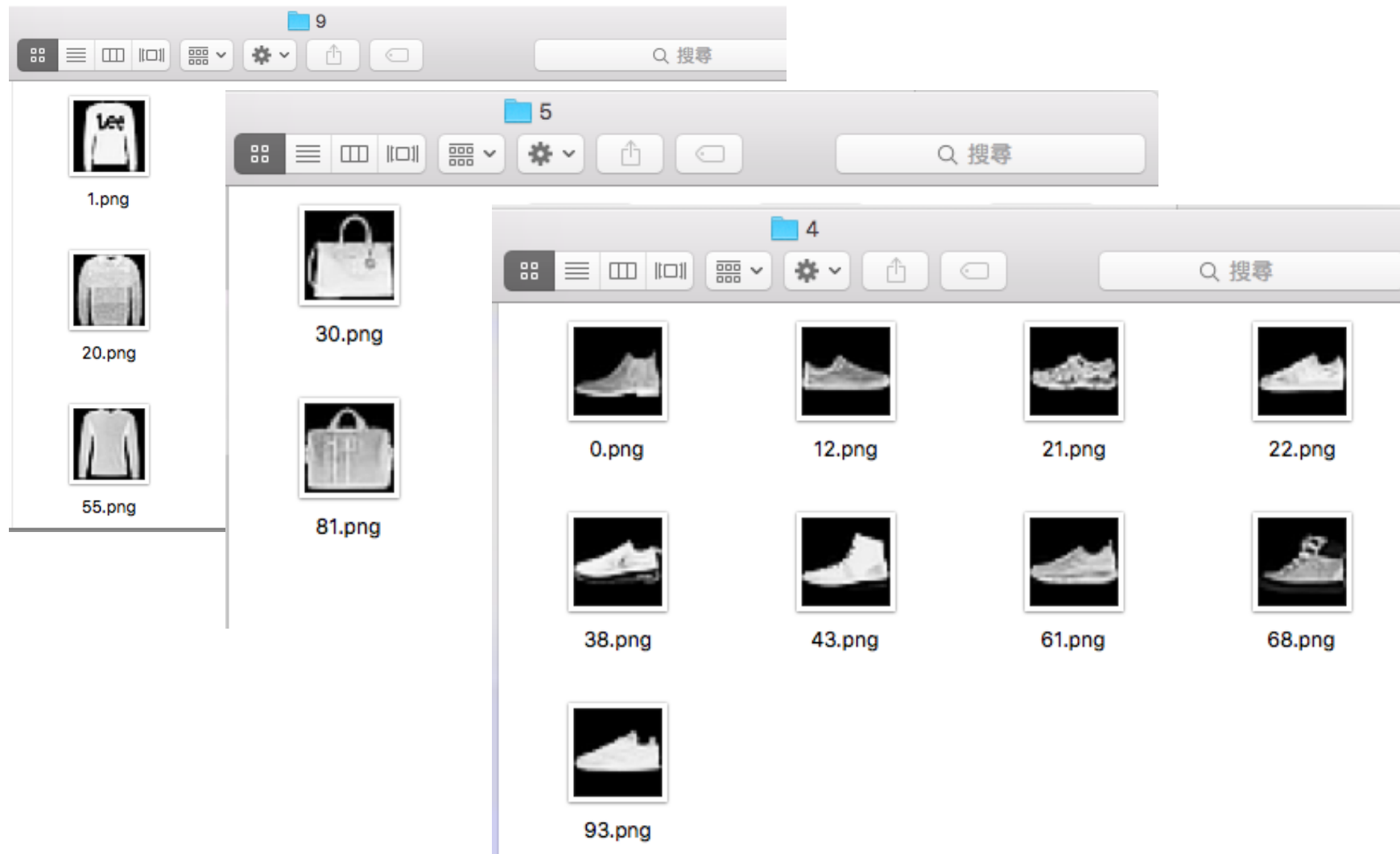
Label = 5   Label = 4   Label = 3   Label = 9   ....

Use encoder to classify image

Reference

- ML Lecture 16: Unsupervised Learning - Auto-encoder
  http://speech.ee.ntu.edu.tw/~tlkagk/courses/ML_2017/Lecture/auto.pdf

- Building Autoencoders in Keras https://blog.keras.io/building-autoencoders-in-keras.html

Code

- https://github.com/WaitingLin/Autoencoder