CS454 Homework 4: Convolutional Autoencoders
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Report

In this homework, firstly I divided the images from the Fashion MNIST dataset into two parts: left and right. As a result, the images, which were initially 28x28 in size, became 28x14. I fed the left side of the image as input to the encoder and then obtained prediction results from the decoder. For these operations, I used four convolutional layers and one fully connected layer. I set my learning rate to 0.0015 and repeated this process for a total of 25 epochs. By comparing the prediction results from the decoder with the right images in the training dataset, I obtained the training mean squared error (MSE). Similarly, by comparing the prediction results with the actual results on the test dataset, I obtained the test MSE.

In figure 1, as the training mean squared error (MSE) consistently decreases over time, I observe that the test MSE initially decreases but then reaches a point where it remains relatively stable with some minor fluctuations.

In other figures, randomly selected images from 10 different classes are displayed (last epoch results). There are a total of 5 different examples from each class.

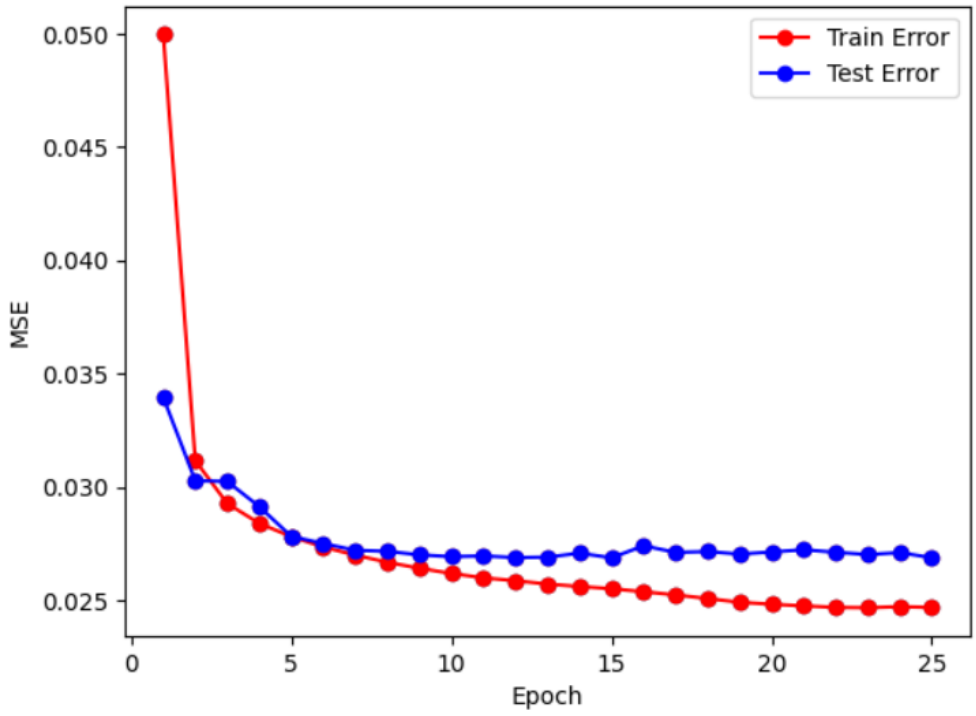

Figure 1: Train and Test MSE

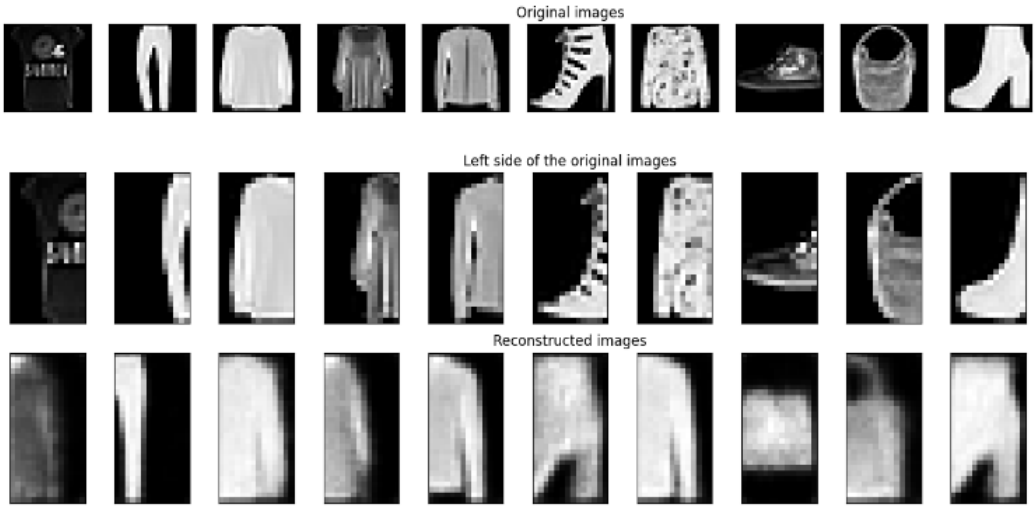

Figure 2: Sample 1

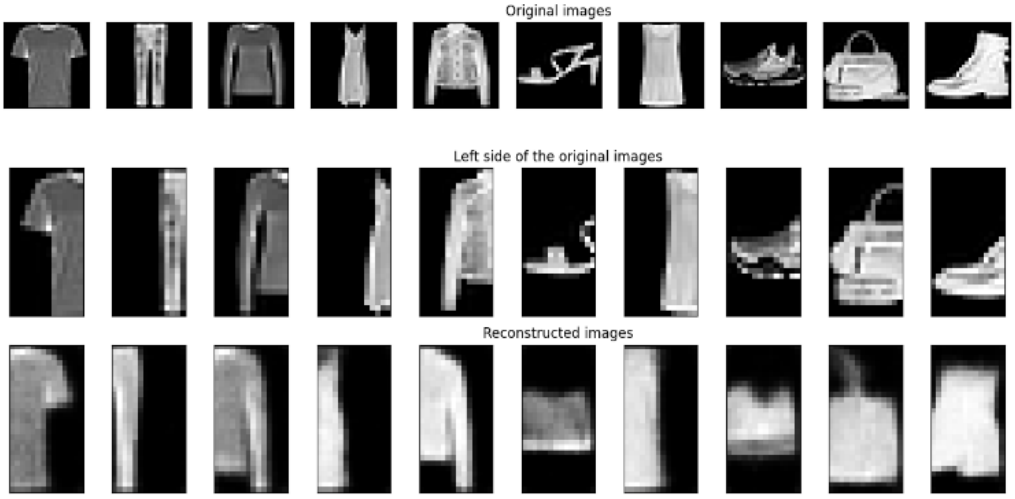

Figure 3: Sample 2

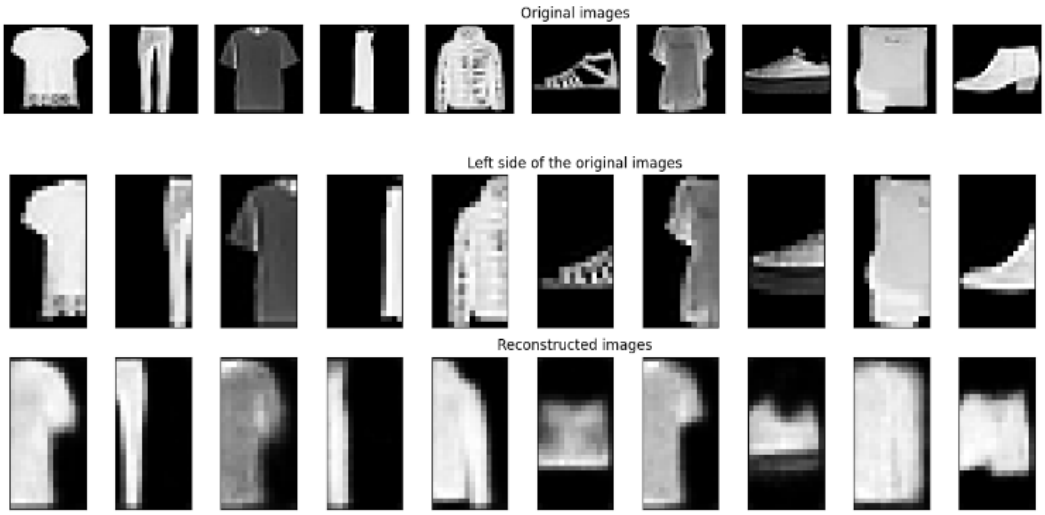

Figure 4: Sample 3

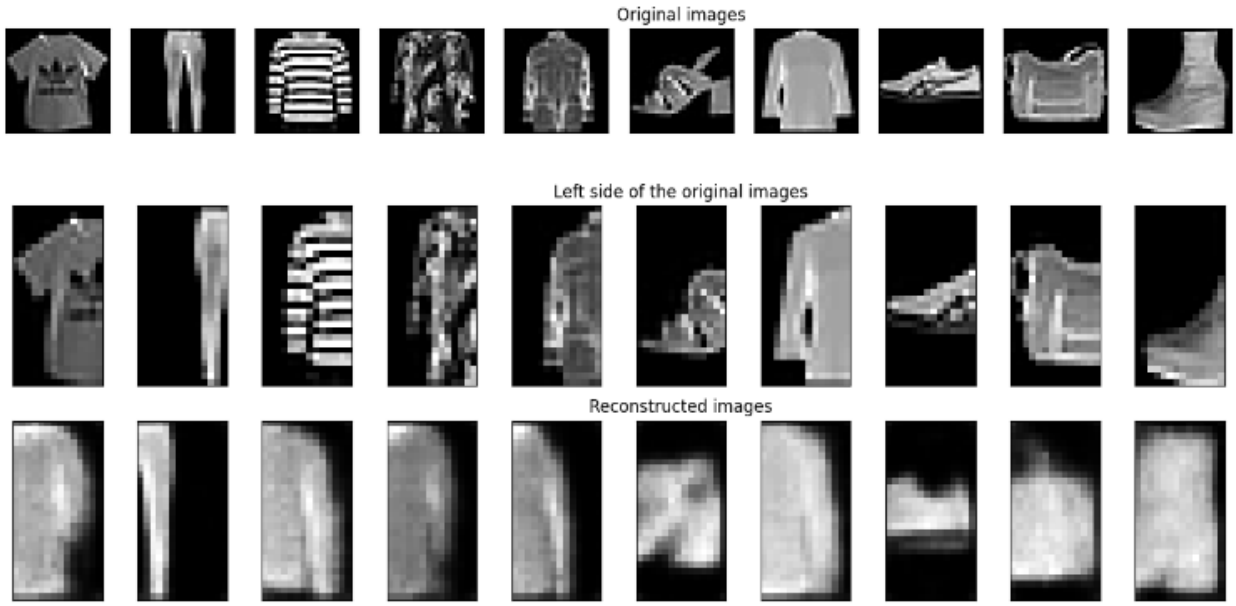

Figure 5: Sample 4

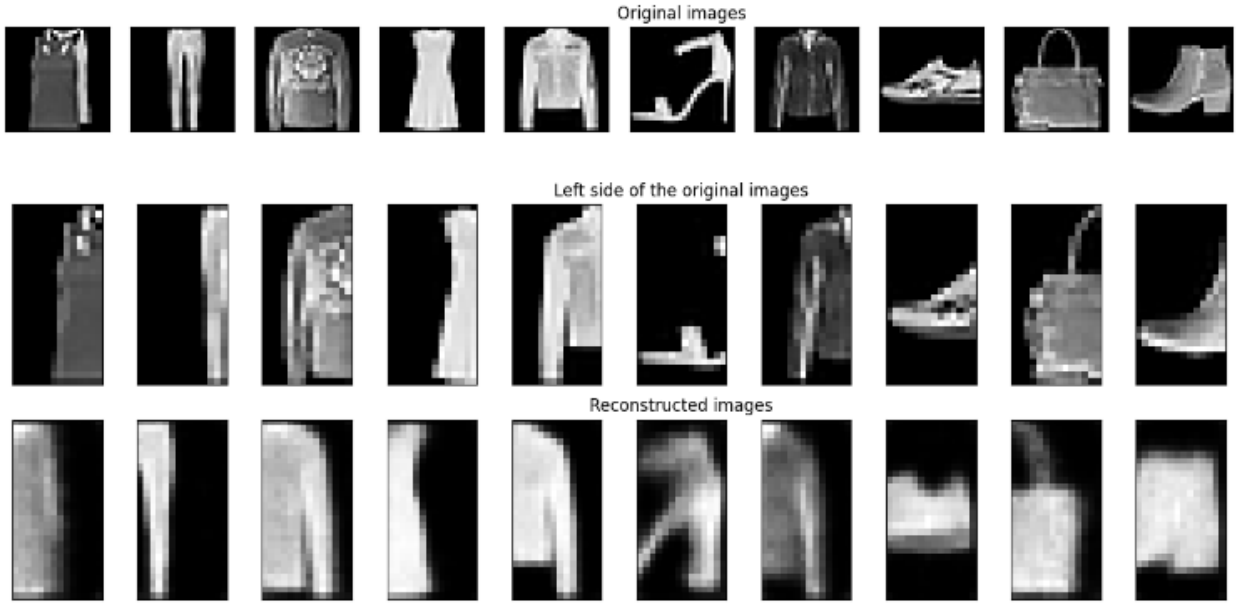

Figure 6: Sample 5