

Abstract

1. Work on ML homeworks
2. Prepare and present Unsupervised Multilingual Word Embeddings for NLP course
3. Continue reading about literature of AE, VAE, etc.
4. Implement the AutoEncoder idea

Description

1. Work on ML homeworks

I started to review ML course resources for RL topic and prepared for homeworks.

2. Prepare and present Unsupervised Multilingual Word Embeddings for NLP course

I read UMWE paper and presented it in NLP class

3. Continue reading about literature of AE, VAE, etc.

I read a little bit about loss functions of reconstructing images.

Perceptual Similarity Metrics:

http://www.cs.toronto.edu/~jsnell/assets/perceptual_similarity_metrics_icip_2017.pdf

Generating Images With Perceptual Similarity Metrics Based On Deep Networks:

<https://arxiv.org/pdf/1602.02644.pdf>

4. Implement the AutoEncoder idea

Finally i implemented the AutoEncoder idea and came up with interesting results. I trained an AutoEncoder model which is meant to divide the compressed information of an image into two separate divisions: **Label** and **Latent representation of style**. This model can extract the style of an input image (e.g. an MNIST digit) and use it to construct new image with another label (another digit) based on it. Ali Osia helped me defining four different losses with different responsibilities:

Reconstruction Loss: To reconstruct an image which looks similar to the input distribution.

Classification Loss: To correctly classify the input images and embed a classifier model inside the AutoEncoder model.

Encoding Loss: To ensure latent style representation of generated image is equal to the input image.

Generation Loss: To make sure generated image contains the new label information and would be correctly visualizing the new content in the same style.

However, i havn't yet tuned models hyper-parameters and it may took a while; But this model still generates almost good looking images. Figure 1 shows an example of results.

Next Week

- Study SP for final exam and complete homeworks
- Complete reading MLs RL topic and start doing its homeworks
- Continue reading about literature of AE, VAE, etc.

References

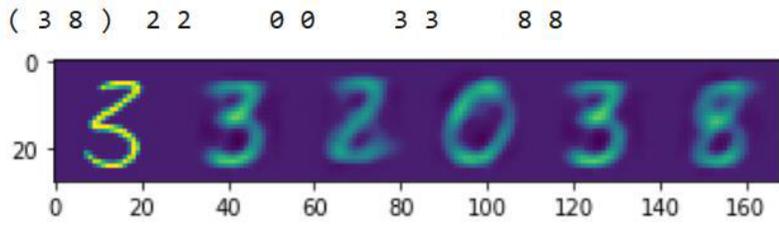


Figure 1: (left to right) An MNIST '3' digit, its reconstructed image, four randomly generated digits with new labels (2, 0, 3, 8) with similar style