LAB

Task

Our task was to work a little with CNN and MNIST dataset. We had to define the structure and train the network. After that, we had to study the influence of learning rate and a number of filters on network performance. That led to the conclusion that properly chosen parameters are really important. As result, we introduced random search and studied the best performing configuration.

Architecture of the network

Layer	# of Units	Activation function	Size
Convolutional layer	16	ReLu	3
Pooling layer	-	-	2
Convolutional layer	16	ReLu	3
Pooling layer	-	-	2
Dense layer	1024	ReLu	-
Logits layer	10	Sigmoid	-

Table 1: Parameters for each layer
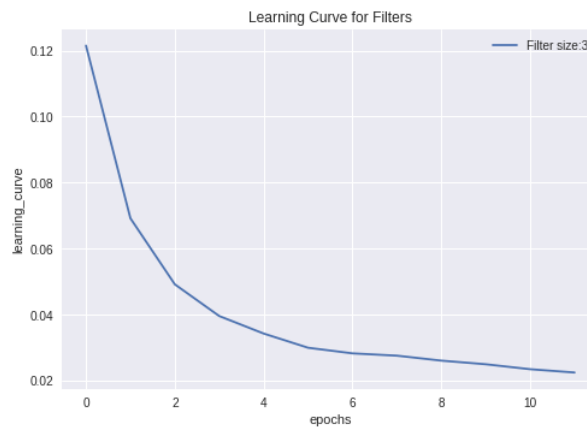
Default values

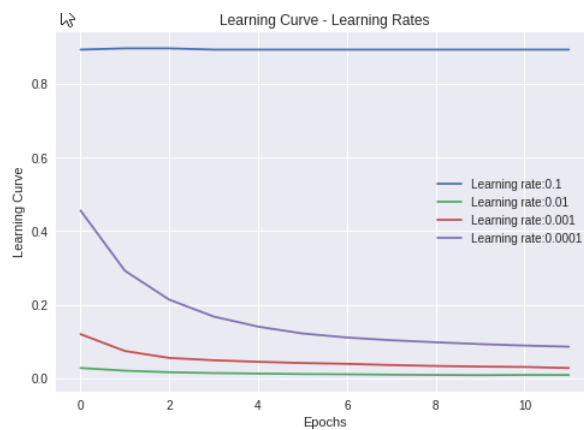Figure 1: Learning curve

Learning rate importance

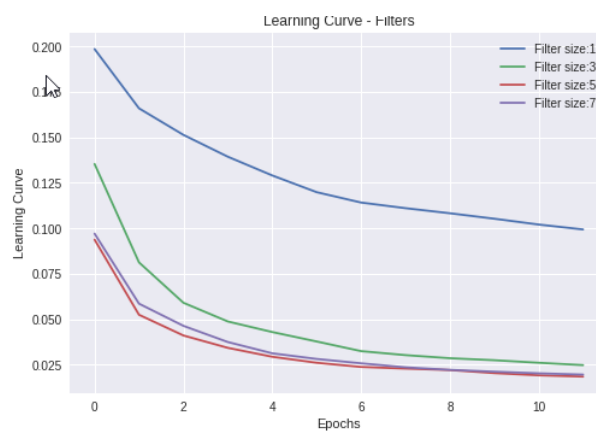Figure 2: Learning curve

Number of filters importance
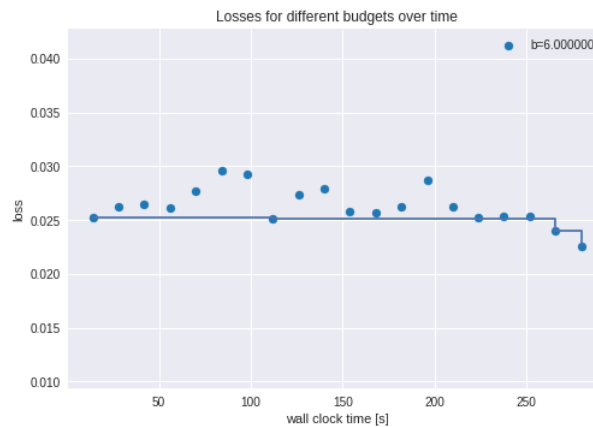

Figure 3: Learning curve

Random search

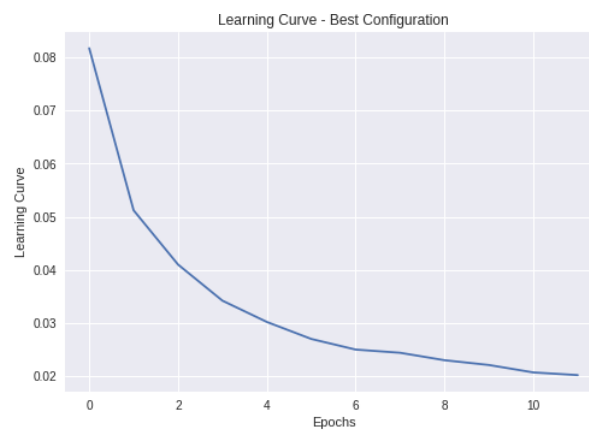Figure 4: Loss

Best performing configuration

Figure 5: Loss

Comments

- I got some problems running the code on my Windows-based machine, after a long fight I switched to Google Colab. I hope it is not a big inconvenience.

- I will provide the Google Colab notebook with the results saved in the output, I will also try to create .py files, but I cannot check if they are running properly