Experimental training of a convolutional network in TensorFlow

To compare the libraries, the same network topology was chosen. It consists of:

- 3 convolution layers (Activation ReLU)
- 2 fully connected layers with 256 and 64 neurons (Activation ReLU)
- 2 output neurons
- Activation - sigmoid
- Losses cross-entropy

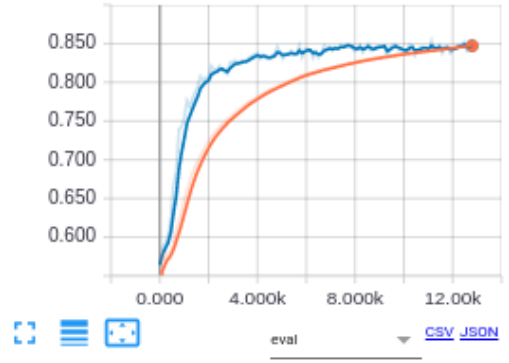
During the training

During the training, the following parameters were monitored:

- Accuracy
- Losses
- The proportion of correctly recognized gamma
- The proportion of incorrectly recognized protons
- Quality Q (as in Stanilslav presentation)

accuracy

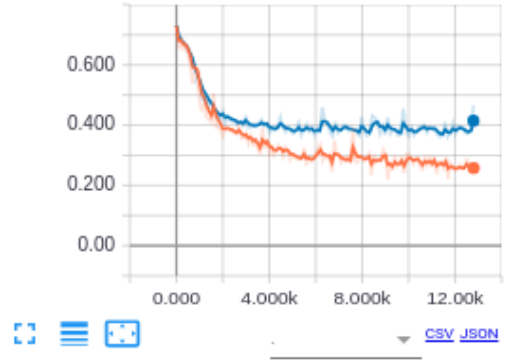
accuracy



global_step

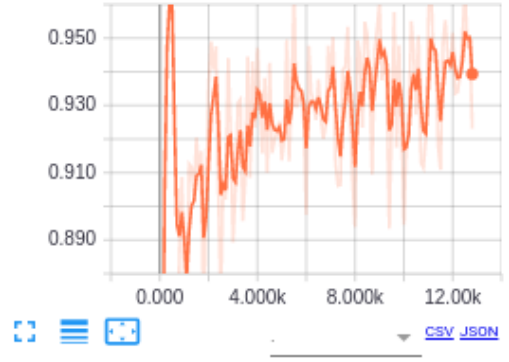
loss

loss

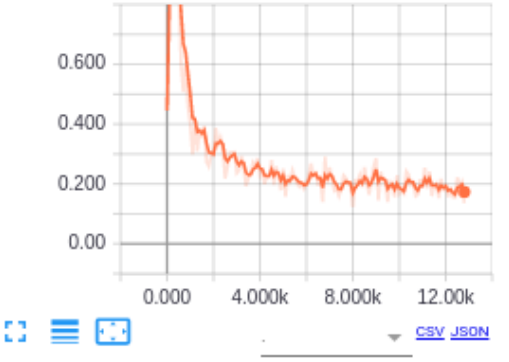


quality

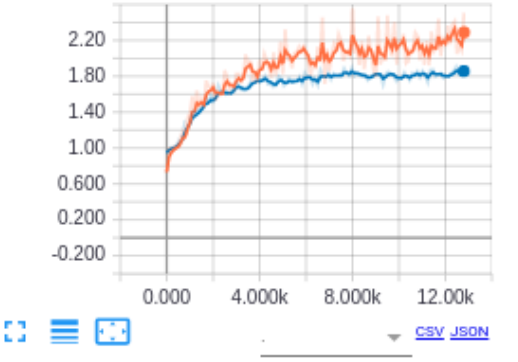
quality/gamma_as_gamma_div_N_gamma



quality/proton_as_gamma_div_N_proton



quality/quality



Results

- For train 70% events(~12000)
- For test 30% events(~5000)
- Training time: ~1 hour

Results:

- Quality on test sample ~1.8
- Accuracy ~ 87 %
- Correctly recognized gamma 92%
- Incorrectly recognized protons 20%