Neural Networks Implementing a Convolutional Neural Network with Keras for action recognition in videos

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1 Color Branch

We set up a convolutional neural network to classify the provided videos. On the RGB data, we get a test accuracy of **0.433** (and a loss of 2.324) with our pre-trained weights.

Once we train our network over 30 epochs, we obtain a test accuracy of **1.0** (with a loss of 0.023). Our initial results have thus improved to a perfect classification.

2 Optical Flow Branch

We use the same CNN to classify the provided videos according to their flow data this time. On the flow data, we get a test accuracy of **0.233** (and a loss of 2.958) with our pre-trained weights.

Once we train our network over 30 epochs, we obtain a test accuracy of **1.0** (with a loss of 0.079). Our initial results, which were less good than the color-based ones, have also improved to a perfect classification.

3 Siamese Network

We modify our CNN in order to make it a siamese network that merges its two input branches just before their last fully connected layer.

The test accuracy of our pre-trained weights is **0.133** (with a loss of 4.584). If we train our network over 30 epochs, with a batch size of 5 due to memory limitations, we obtain a test accuracy of **0.433** (with a loss of 4.537). If we keep training up to 100 epochs, without any dropout, the accuracy rises to **0.633** (with a loss of 4.445). Just as with the single-branch model, we once again see noticeable improvements in the accuracy after training. However, the results of the siamese network are inferior to that of the single-branches previously done.