

Exercise 2

Deep neural networks with Keras

Look at data in the file “secreckkeys_exe.csv”, which is placed in the google folder.

1. Assuming that there is an invariance of the results with respect to shift of the digits in a data sample (e.g. 1234567 and 7123456 give the same result $y=0$ or $y=1$), try to improve the accuracy of the model over the validation data set by “augmenting” the data. In practice, for every sample there are $L-1$ equivalent ones.
2. Implement a “grid search” as shown in NB11 to improve one or more of the aspects or parameters of the model. Possible tests include: different activation units (sigmoid, relu, elu, etc.), different minimization algorithms (adam, rmsprop, sgd with momentum, etc.), different dropouts, etc.
3. See if any rescaling of data (x : the sequences of 0 and 1 used to feed the network) may improve the results.