

WASC – Deep Neural Network

Walter Zigliotto, Andrea Nicolai, Sandeep Kumar Shekhar, and Camilla Quaglia
(Dated: April 15, 2020)

DDN is ...

INTRODUCTION

The main purpose of this project is to setup a Deep Neural Network with only two layers in order to see which set of parameters leads to the best performance. The goal is to predict whether a **SEE AGAIN VIDEOS FOR NUMBERS** sequence of 7 numbers hides a key **OR TWO?** subsequence of **XX** digits inside itself, once we have trained the network on a provided dataset.

WHAT IS A DNN.

just few lines on parameters we changed: WHAT IS AN ACTIVATION FUNCTION (it must be not linear, it rules output of single nodes...)
WHAT IS A REGULARIZATION (regularize weights in order to prevent overfitting)
WHAT IS A DROPOUT (we "burn" some nodes in order to enlarge stochasticity and thus generalization "property" of the network therefore preventing overfitting)
WHAT IS AN OPTIMIZER (to train network we minimize the loss wrt to weights at each epoch, so in order to find the minimum we use different algorithms)

METHODS

We used Python and also Keras with Tensorflow backend (IMPORTANT TENSORFLOW SINCE THERE ARE ALSO OTHER BACKENDS, AND IN RESULTS THERE ARE SOME CONSIDERATIONS ABOUT THE VERSION...).

from exercise text: "Assuming that there is an invariance of the results with respect to shift of the digits" WE

AUGMENTED THE DATA IN ORDER TO ENLARGE DATASET

HOW DID WE DO THIS? CODE NEEDED? -j

WE IMPLEMENTED A GRID SEARCH

WE ALSO TRIED TO "NORMALIZE"
SHIFT/RESCALE THE DATA

RESULTS

HOW DIFFERENT METHODS WORKED: -FOR NORMAL DATA WE HAVE SMALL ACCURACY AND OVERFITTING (PLOT)
-FOR AUGMENTED DATA WE HAVE PERFECT PERFORMANCE
-RESHIFT IS JUST A WASTE OF TIME

WHICH SET OF PARAMETERS HAS LED US TO WIN THE COMPETITION

A FEW LINES ABOUT TENSORFLOW BACKEND THAT IF 2.0 WE OBTAIN 100% PERFORMANCE, WITH SAME SAME SET OF PARAMETERS (even seed) IT IS DIFFERENT.

CONCLUSIONS

PRAISE THE SUN
