# DEEP LEARNING: EXERCISE SHEET 4 (SOSE2018)

#### 9TH OF MAY (DUE 16TH OF MAY AT 14:00)

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### **QUESTION 6**: REGULARIZATION - 15 POINTS

Consider  $x = \begin{pmatrix} -1 & 1 \end{pmatrix}$  with output y = 2 and the network below:



a) Perform a forward and backward pass without Regularization

b) From scratch, perform a backward pass using L1-Regularization. (Use penalty as described in the picture).

c) Comment on the results for a) and b)

## **QUESTION** 7: DATA AUGMENTATION- 5 POINTS

Jane Doe has a data-set that contains speech ".wav" files. However this data-set is not so big. Jane wants to build a model that reads the ".wav" files and classify the speaker as male or female. Suggest data augmentation methods that might help Jane and explain why augmentation helps with regularization.

### **ATTENTION!**

DO NOT FORGET TO WRITE YOUR NAME ON YOUR SHEET! Nameless sheets will NOT be graded! Do not rely putting your name on your file.

### WARNING!

If we detect **Plagiarism** on your solution, you will receive no points for it. If a second plagiarism attempt is detected, you might fail the class or be expelled from your program.

You are allowed to discuss solutions, but if you work on a group, you must indicate on your sheet with whom are you working with.

Group submissions earn 0 points, but counts as participation.

### How to submit?

DO NOT FORGET TO WRITE YOUR NAME ON YOUR SHEET! Nameless files will NOT be graded!

The new submission method is via LearnWeb.

Link to the tutorial (ld 3108) is here: https://
lsf.uni-hildesheim.de/qisserver/rds?
state=verpublish&status=init&vmfile=
no&publishid=70814&moduleCall=
webInfo&publishConfFile=webInfo&
publishSubDir=veranstaltung

And enroll also on the LearnWeb course: So that we can post your grades, news and receive your exercises: https://www.uni-hildesheim. de/learnweb2018/course/search.php? search=3108

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