

Introduction to ML

Exercise 5

Due: 14.1.2022 22:00 (last day of the semester)

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Guidelines

1. You are allowed to work in pairs.
2. For pairs, only **ONE** student should submit.
3. In order to submit your solution please submit the following files:
 - (a) **details.txt** - A text file with your full name (in the first line) and ID (in the second line), see the attached example file **details.txt**.
 - (b) **ex5.py** - The file that contains your main function (attach ANY additional files needed for your code to run).
 - (c) **ex_5_report.pdf** - A pdf file in which you describe your model and parameters.
 - (d) **test_y** - your model's predictions on the given test set (see instructions below).

Follow the instructions and submit all files needed for you code to run.

Good Luck!

Ex5

You will train a model to classify a speech command using speech data. The provided dataset contains 30 different categories of commands. Your task is to train a classifier that classifies this data. You can use all models / techniques we have talk about during the course, e.g. DNN / CNN / RNN / Dropout / BatchNormalization / Optimization Methods / Etc.

Data. Each speech utterance is ~ 1 sec long. You are provided with a pytorch dataset reader called `gcommand_dataset.py`. An example for using this dataset can be found the the end of the file(line 151)- check it. Suggestion: save a small portion of the dataset and use it for debugging. When you are done, load the entire dataset to train your model.

Instructions

1. Your goal is to train a multi-class classifier based on all what we have learned during the course. Your model should reach the best performance you can get on the validation set.
2. You will receive the data already split to train, validation, and test sets. Each category will be in a different folder.
3. You are provided with a file named: `gcommand_dataset.py` to read the data and extract features from it.
4. You should train and validate your model. Finally, you should output you model's predictions on the examples in test folder to a file named `test_y` where the i 'th row should contain
<file name>, <your model's prediction for to the i 'th example>
Example:
`0.wav,stop`
`1.wav,down`
...
`6834.wav,cat`
5. Describe your model's architecture and explain how you chose it and all hyper-parameters in `ex_5_report.pdf`. In addition, describe how to run your model - your program shouldn't follow a pre-defined running command line - implement as you wish.

6. Submit **ALL** source code files along with your predictions file `test.y`. Note that you name it exactly as specified. Your grade will be based on your performance on the test set (accuracy of 91%+ will be graded as 100).
7. **Check the feedback mail to see if there are any errors.** The feedback mail will also include a basic sanity check - your accuracy on a random subset containing 200 examples from the test set. **If you get 0- read the errors and re-submit!.**
8. P.S - In case both partners submitted - the **last one counts**.

Good Luck!