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Igor Sikorsky Kyiv Polytechnic Institute

Computer Vision

Assignment #4 | Autumn, 2024
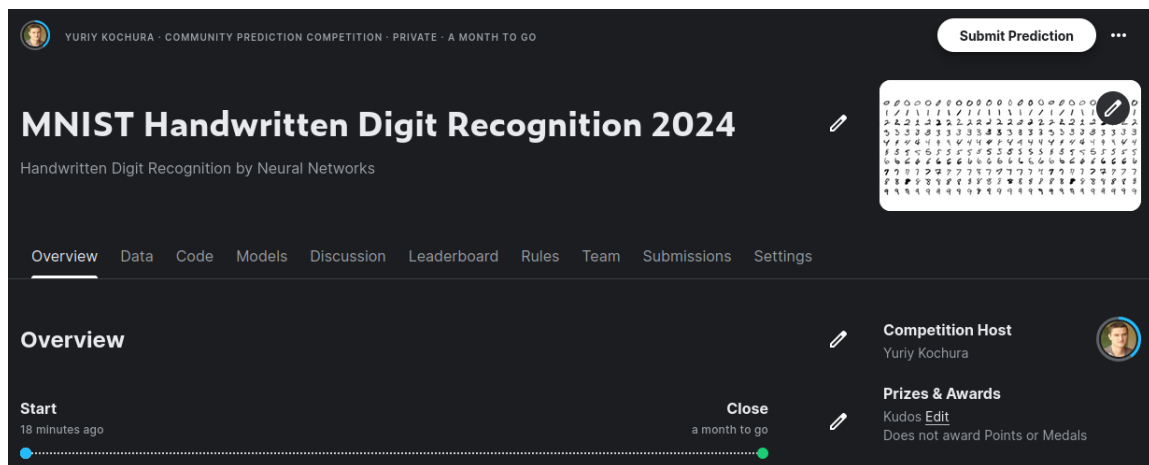
MNIST: Handwritten Digit Recognition

"Small daily improvements over time create stunning results."

– Robin S. Sharma

Task description

Recognize gray-scale images of handwritten digits by neural networks.

1. You will need an account kaggle to complete this task (create or use an existing one).

2. Follow the link, read and accept the terms of the competition:
   https://www.kaggle.com/t/b90762c62f1a41d7a5fd9e5b8beb9bd9

3. Your task is to train the model so that it recognizes handwritten digits from the test dataset of the competition as well as possible. (`test.csv`).

4. The prediction of your model should be submitted on a competition page: a tab Submit Prediction.

5. Some examples of how to do this can be found [`here`], [`here`] or [`here`].

Evaluation

The assignment is worth a total of 15 points.

Your grade for the assignment will depend on the following:

- 10% – the script with your model (should be commented in details): `First name Last name_Group.ipynb`

- 40% – performance on Kaggle. Maximum score if the prediction accuracy on the test set is > 0.98

- 50% – a report. You should provide a detailed description of the data set you used for this task, describe the process of setting up the model and preparing data for training, obtained results and conclusions. A rather formal report written in LaTeX is expected. If you do not want to install additional software, you can use the www.overleaf.com to prepare a report. The template for which you need to prepare the report you can be find at HERE

The structure of this template:

```
...

├── code      # Directory for code files (code listing in the report)
│   ├── test.py
│   └── hello.c
├── images     # The main directory for images (.pdf, .jpg, .png)
│   └── NN_.pdf
├── logo       # Directory with KPI's logo
│   └── LogoKPI.jpg
├── main.pdf        # Produced file after compiling main.tex
├── main.tex        # TeX  the report file for editing
├── ref.bib         # Bibliography (BibTeX)
└── report.cls   # Report style settings file
```

Submission

Archive `Name Surname_Group.zip`, please, sent for review at https://cloud.comsys.kpi.ua/s/EWw9m5sZQcMx9tY

This archive should include:

- the script of your model commented in details: `First name Last name_Group.ipynb`
- your report (.pdf file) and other LaTeX files used to produce the report

Deadline: before 11:59 PM, December 15 (Europe/Kyiv (GMT +02:00) timezone)

Note! There is no additional deadline for this task.