

Deep Learning - MAI

Autonomous lab - CNNs

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The rules

- ❖ **Time:** 1 month to delivery (start now!)
- ❖ Done in **couples** (if possible)
- ❖ **Evaluation:** 30 minute interview (Why did you do 'X'? Why not 'Y?')
 - Individual evaluation, non-transferable questions
 - Bring the material you used to take your decisions to support your work (loss/acc plots, histograms, conf. mat., etc.)

The task



- ❖ **MAMe**: Museum Art Medium dataset
 - High-resolution, variable shape images (*LR&FS* 256x256 available)
 - 29 classes of materials and techniques
 - Train: 700 samples/class, Validation: 150 samples/class, Test: varies
- ❖ Get the highest possible accuracy
- ❖ Run the test set once, the last thing before the interview



The links

❖ **MAMe**: Museum Art Medium dataset

- *High-resolution, variable shape images:*

https://storage.hpai.bsc.es/mame-dataset/MAMe_data.zip

- *Labels:*

https://storage.hpai.bsc.es/mame-dataset/MAMe_metadata.zip

- *Low resolution, fixed shape:*

https://storage.hpai.bsc.es/mame-dataset/MAMe_data_256.zip

The tip

- ❖ Focus on the low resolution version
- ❖ Only if you find you reached the limit... (ca. 75%-80%)
 - Consider using higher resolutions (training time will go UP!)
 - Consider avoiding deformation
- ❖ Try your own design using the methods introduced in theory

The DO NOTS

- ❖ Do not use pre-trained models
- ❖ Do not replicate well-known designs
- ❖ Do not use external data
- ❖ Do not share code
- ❖ Do not wait until the last week

The next steps

- ❖ Explore the data. Visualize it. See its distributions
 - ❖ Prepare the data pre-processing pipeline. This is the backbone.
 - ❖ Start with a small design. Underfit.
 - ❖ Grow. Overfit.
 - ❖ Regularize and reduce. Fit.
- Thoroughly document old experiments, and the evidence you use to decide the new ones.

The sauce

- ❖ A scoreboard of models will be maintained
- ❖ Once a week, you can send me your best validation accuracy, together with a link to the model, and the model “name”
- ❖ The top model each week will get +0.25 in this lab (for both students)
- ❖ Not necessary to participate. It’s just for motivation. You “*still*” can get a 10.

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