Project 3 guidelines- Nueral networks for object detection

In this project you are going to train an object detection with transfer learning.

This project will conclude the third part of the course, tackling all topics regarding NN. We are actually doing here "transfer learning" ourself- from classification to object detection.

Part 1: Written report

1. Take the sum of IDs of all people in the group and take the last digit from it, this corresponds to your chosen new architecture:
    - 0-3: MASK RCNN
    - 4-6: YOLO v3
    - 7-9: SSD with mobilenet backbone
2. The first part of your PDF should show your calculation above. -10 points to groups that are wrong with this calculation (we have your IDs).
3. write a summary of at least 2 pages on this architecture, explain about the loss chosen and any new blocks we haven't learned about. You can find all original articles on the web and further explanations in google.

Part 2: Implementation

In this part we will implement a transfer learning task on the above chosen object detection architecture.

1. Choose an object detection dataset (this is a good place to try: https://public.roboflow.com/object-detection).
2. build a complete NN training pipeline- make sure to split the data accordingly; make sure to freeze some of the layers; do some augmentations (try `albumentation` if you like); plot the training and validation loss and accuracy scores (try `tensorboard` if you like); What is the score on the testset?
3. Find some short video NOT FROM THE DATASET and run inference of the learned model on the video. save the results.
4. Explain in the final PDF what you did when implementing.

submission guidelines:

1. Groups of up to 2 people.
2. You can use either `pytorch` or `tensorflow` as you prefer (I know `pytorch` better if this is relevant)
3. Results expected in a .zip file with the name ``PROJ3_NAME1_ID1_NAME2_ID2.zip` with content of:

- A detailed summary of the work done and assumptions made. Where does your algorithm succeed and where it failed?
- Code in .py files
- The output videos in a reasonable format.

3. Submission is due until the day before the first day of next semester.

Good luck here and with the exams!

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