Multimedia Project SoSe 23

Assignment 8

Multimedia Computing Lab
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Submission: July 26, 2023

This is the final assignment.

Exercise 8.1 Bounding Box Regression   10 Points

Implement `def get_bbr_loss(anchor_boxes, adjustments, groundtruths)` which calculates the Bounding Box Regression Loss for a given batch of anchor box coordinates, BBR adjustments, and ground truths.

Implement `def apply_bbr(anchor_box, adjustment)` which constructs an `AnnotationRect` for the given anchor box coordinates and BBR adjustments.

Integrate bounding box regression into your model and train it. Compare the performance of your model with and without bounding box regression. *Interpret* your results and submit them.

Exercise 8.2 Performance Tuning   20 Points

(a) Bring in your own ideas and improve your model even further. Points will be awarded depending on the creativity of your solutions and the effectiveness of your ideas.

(b) Document your experiments and compare your modifications and their effect on the final performance. *Interpret* your results and submit them.

The Multimedia Project Summer Challenge 2023 up to **10** Points

It is common in research to compete in challenges with other researchers on a certain topic. In this course iteration, we will hold our very own little challenge. The winners will receive bonus points that count towards the final mark.

To participate, submit your test set predictions on the challenge website as you have already done for the previous assignment. Submissions will be accepted until July 26. Later submissions are allowed and will still appear on the leaderboard but will not be taken into account to select the winners.

The best participants will receive bonus points as follows:

Position	Bonus Points
1	10
2	8
3	6
4	4
5	2

To receive your bonus points at the end of the challenge, send your code and your model weights that you used to get the uploaded detection file. **If we cannot reproduce your detection file with the given code, your submission will be invalid!**. There must be a function named `def predict_test_set(path_to_test_set, model_path)` which generates the detection file for all images in the test set (located at `path_to_test_set`) using your weights located at `model_path`. The function must only evaluate and not train the model.

Furthermore, your submission must:

(a) not use the Microsoft COCO dataset for training (our selected training and validation subset is fine)

(b) only use MobileNetV2 from the previous assignment for your backbone

(c) only use Python libraries that we have used in the previous assignments

Only if you meet these criteria, you will receive the bonus points. If not, the next participant will take your place.

Good luck!