Assignment 4: Object Detection with YOLOv2

Feb 5, 2019

Objective

To learn about methods of object classification and localization a.k.a. object detection. Acquire hands on experience by deploying YOLO and using it in the context of autonomous driving.

You are provided test data, code template, and the task of making YOLO work on a front facing camera mounted on the hood of a car.

This assignment is a slightly modified version of deeplearning.ai's "Convolutional Neural Networks" assignment available here: https://www.coursera.org/learn/convolutional-neural-networks?

Resources and Instructions

The jupyter notebook containing skeleton code and related resources are available on Learn in a4_files.zip.

The first challenge is getting your environment to work.

Environment Setup:

The conda environment from assignment 1 has not been verified to be compatible with this assignment.

1. Create a conda (package manager) environment with anaconda packages

2. Install tensorflow 1.6 in your conda environment. **It must be version 1.6**
conda install -c conda-forge tensorflow=1.6.0

3. Install keras in your conda environment

4. Get the pretrained YOLOv2 608x608 weights and convert it to keras. Place the model weights in the model_data/ folder.

The following links may help
https://github.com/allanzelener/YAD2K
https://pjreddie.com/darknet/yolo/

Deliverable

HTML output: In the jupyter notebook, go to File > Download as > HTML (.html)
Submit a ZIP file containing the HTML output.

Run all code blocks before downloading the HTML

Please follow the naming convention for your zip file: a4_<user_id>.zip

Due Date

11:59 pm, Monday Feb 11, 2019
No late submissions will be accepted. There will be no extensions.

Marking Scheme

Assignments are marked on a 0 – 5 point scale.

There are 4 main code blocks, each worth 1 point:
1. yolo_filter_boxes()
2. iou()
3. yolo_non_max_suppression()
4. yolo_eval()

Section 3: Test YOLO pretrained model on images is worth 1 point.

0 – No submit / No answers / Irrelevant solutions
1 – 1 of the above is completed and working
2 – 2 of the above are completed and working
3 – 3 of the above are completed and working **or (Tensorflow version is not 1.6 and at least 3 of the above are completed and working)**
4 – 4 of the above are completed and working
5 – 5 of the above are completed and working

Policies

Collaboration

You can discuss the problem with peers, but you must design and implement your own solution independently.

Use of online resources

You may consult online resources for inspiration, but you must develop your own code.