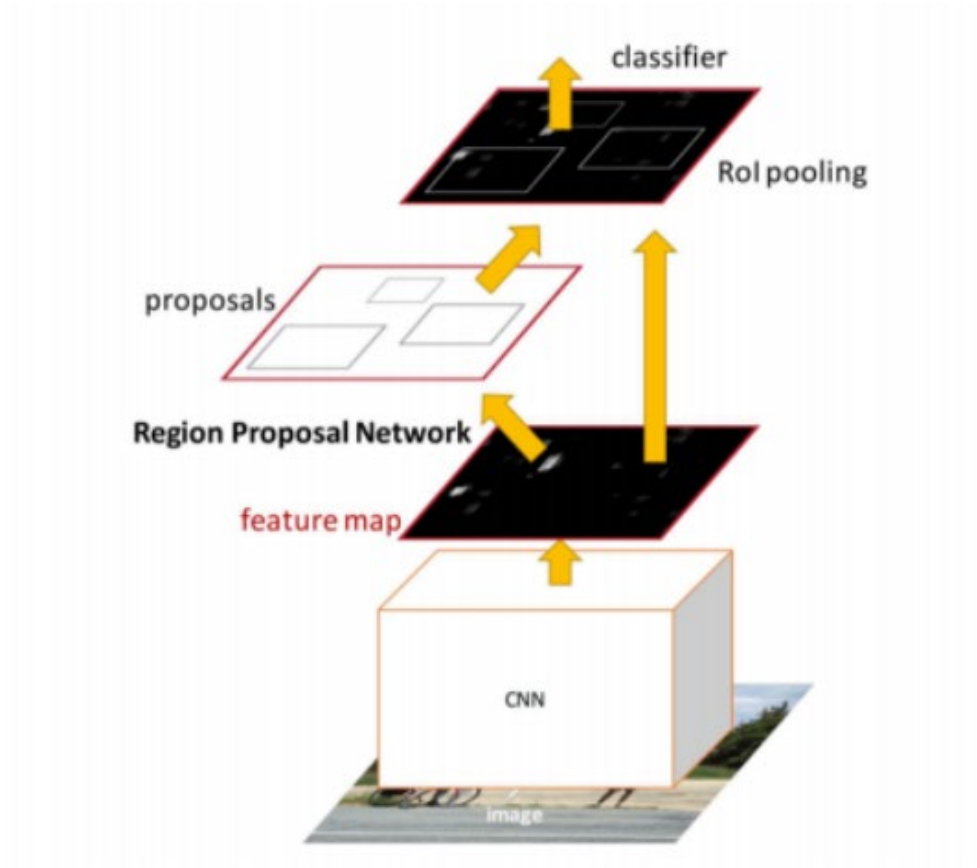
Commodity Detector

Abstract

We are asked to implement a commodity detector on the supermarket shelf. The train data include labels, positions and we use the train data to predict the labels and positions of test data.

Object Detection

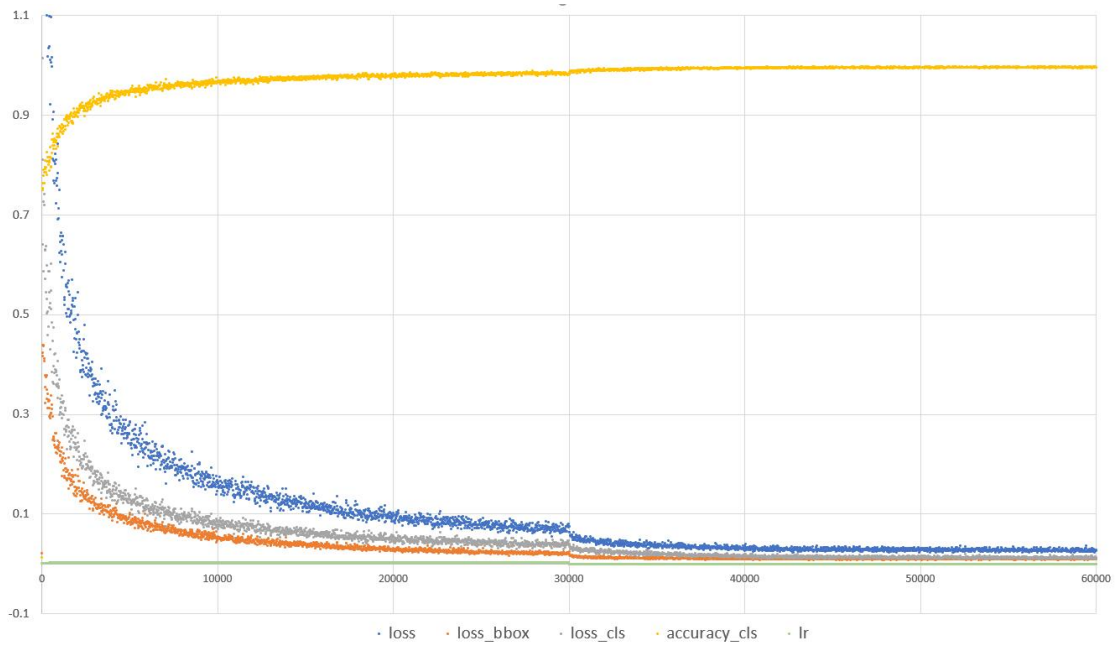
Nowadays, the main technologies of the object detection are faster-RCNN, SSD, YOLO, R-FCN. And now we use faster-RCNN as our model to solve the problem.



And the process of the faster-RCNN can be concluded as 3 steps: (1) use CNN to extract features (2) train RPN (3) use proposal and features to train faster-RCNN and classify and regress.

Experiment

I convert the modified data with augmentation into the required form to fit the data format in COCO. And I spilt the original dataset into two parts: train dataset and validation dataset. Because the pictures which are similarly numbered may be taken at the same supermarket shelf, I spilt the odd numbered and even numbered pictures into different dataset. I use the coco API to train the model and pay attention to the MAP(50:95:05).



Results and Conclusions

When we observe the result pictures, we can find that most commodities are correctly detected, but some yoghurt in bottles are often recognized as drinks or some snacks in square packaged are often recognized as instant noodles. It may be a pity, but we can comprehend because they are in similar shape. Thus, faster-RCNN is a good model on a whole.