Draft paper for Button

Introduction

- Approach: automatic, Industry, automated optical inspection, computer vision, AI, deep learning.
- Button of phone: necessary in industry; size, shape of button (very small → difficult to see by human), ...
- Type of defect:
- Purpose: localizing and detecting surface defects.

Method

- Overview diagram:

  Image Acquisition → preprocessing → machine learning → predict defect.
- Image Acquisition and Techniques: camera model, optical method, light material.
- Object detection method: Mask R-CNN
  - Instance Segmentation
  - Proposal Generation
  - Feature Representation Learning

Pre-processing: get eclipse region

- Labeling data
- Create mask
- ROI eclipse and accurate
- Super-resolution (x3): small → zoom out → increase accurate for next step

Defect detection techniques

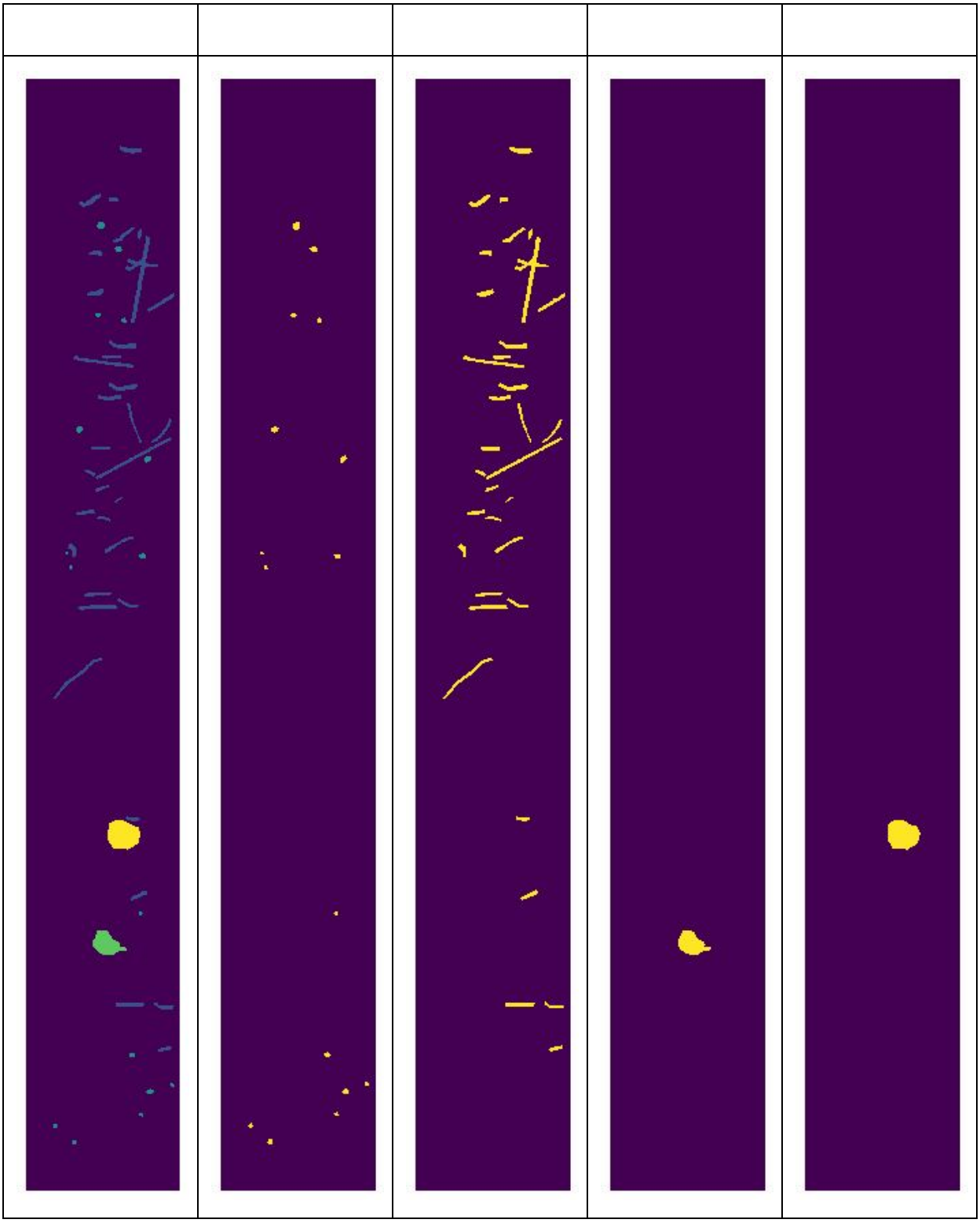
- COCO format
- Analysys mask
- Learning Strategy: train/test dataset, data augmentation, imbance samples, ...
- Mask r-cnn:
  - Backbone Architecture: RestNet50
  - Feature pyramid networks (FPN)
  - ROI head, mask classifier
  - Class number
- Loss function
- Train parameters: epoch, LR, worker, gpu, …
- Inference, predict defect

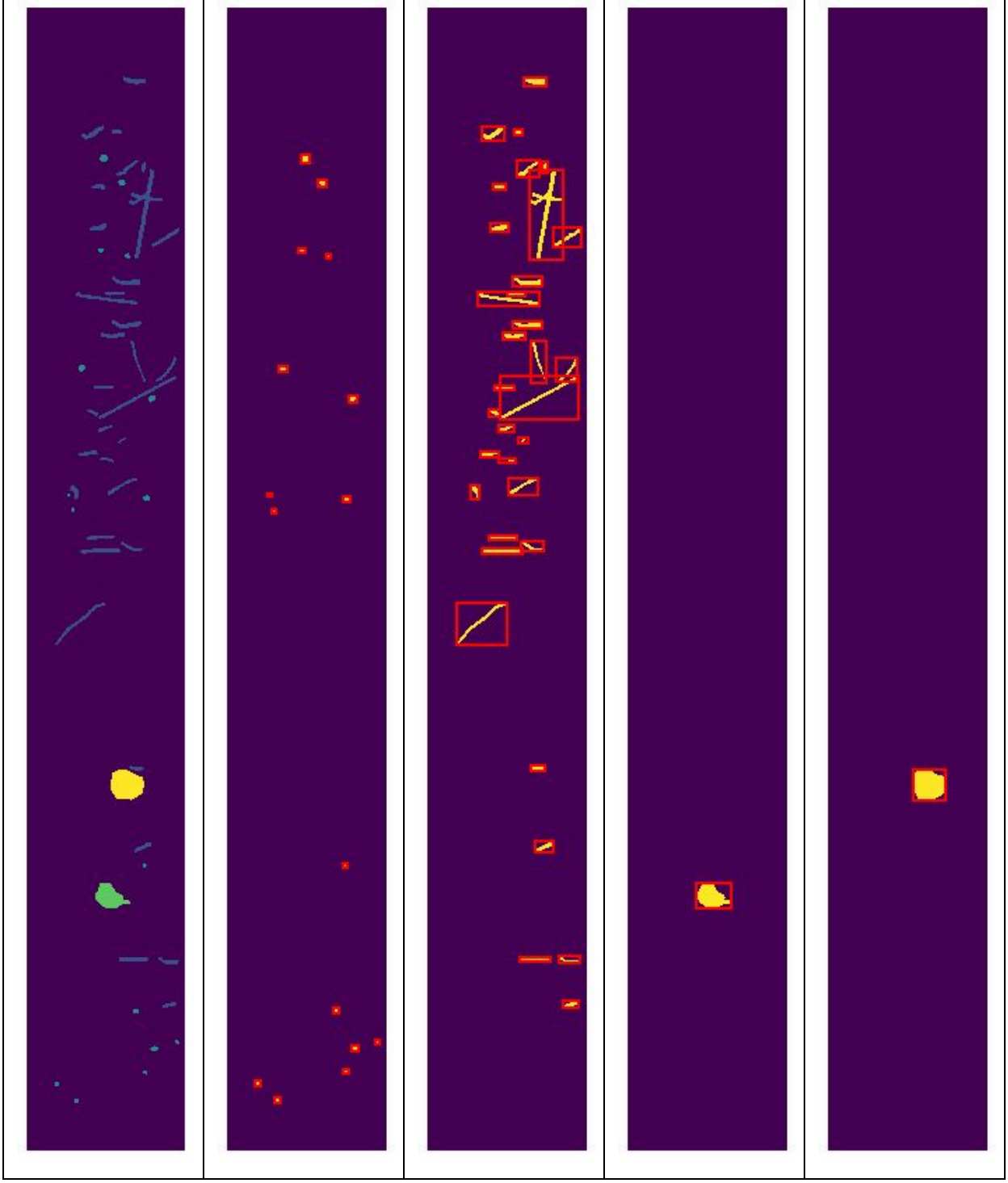
Experiments

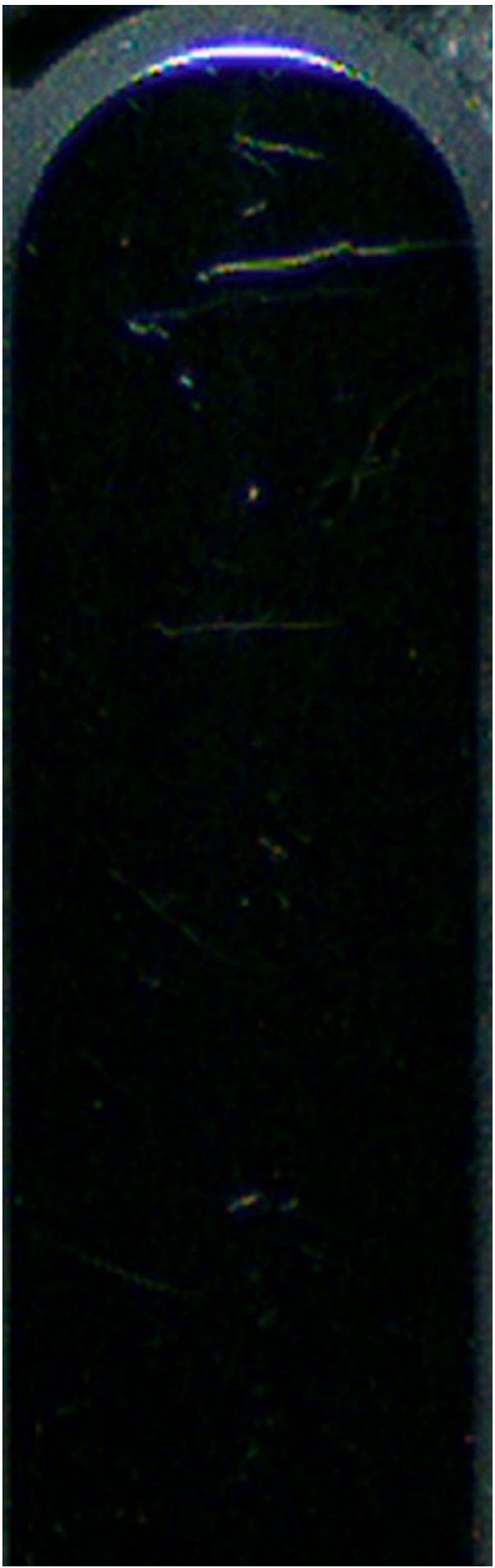
- Measure Metric: box AP, mask AP, train time

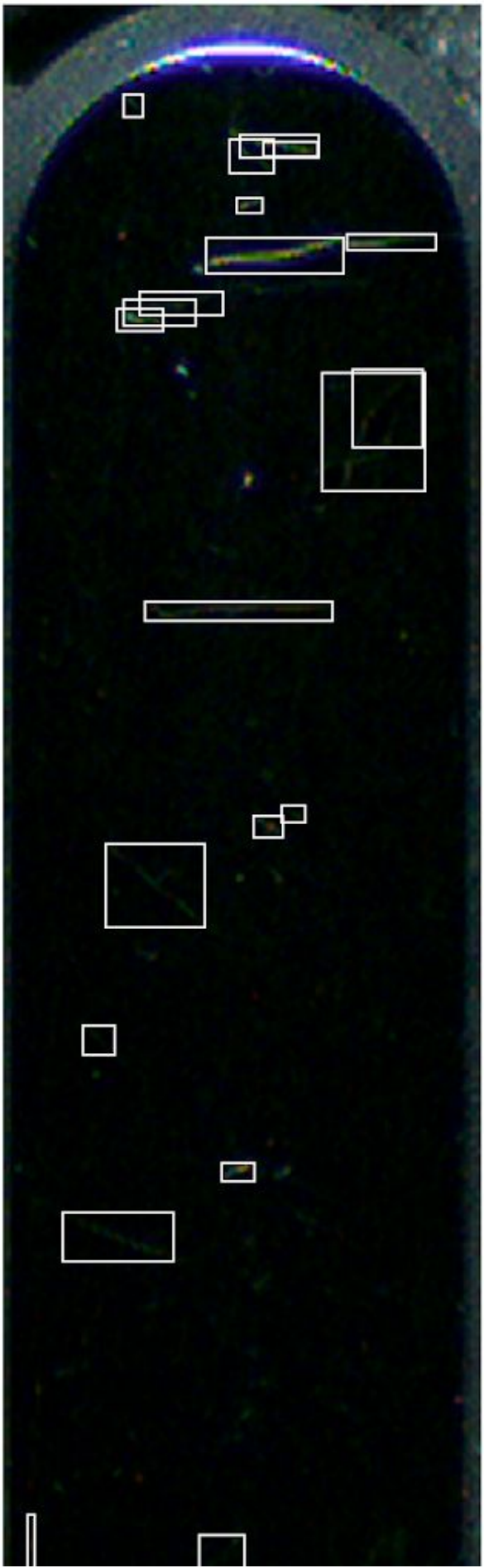
Conclusion

Analysys mask

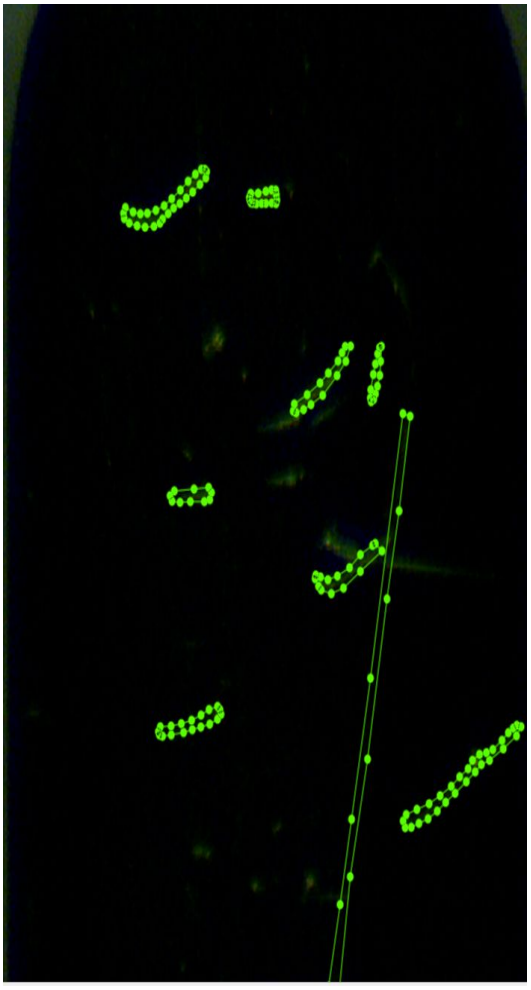


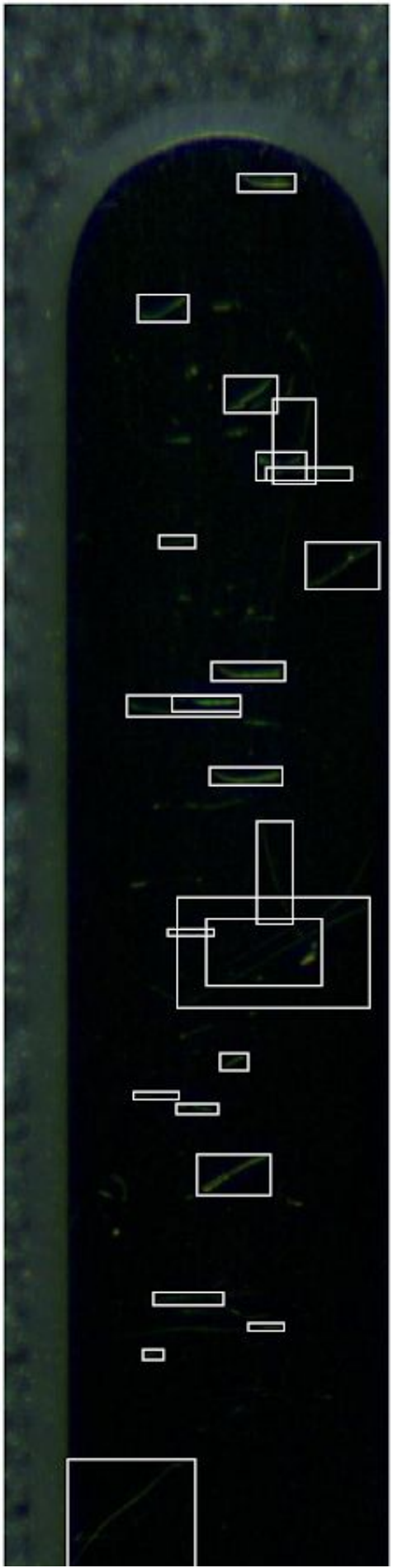






Trained image by label	predict





[1]. Recent Advances in Deep Learning for Object Detection
https://www.dlology.com/blog/recent-advances-in-deep-learning-for-object-detection/