

Yolov4 object detection

Why YOLOv4

R-CNN & Fast R-CNN

1. Though very accurate but slow. Runs 2000 times on the same image.

YOLO models

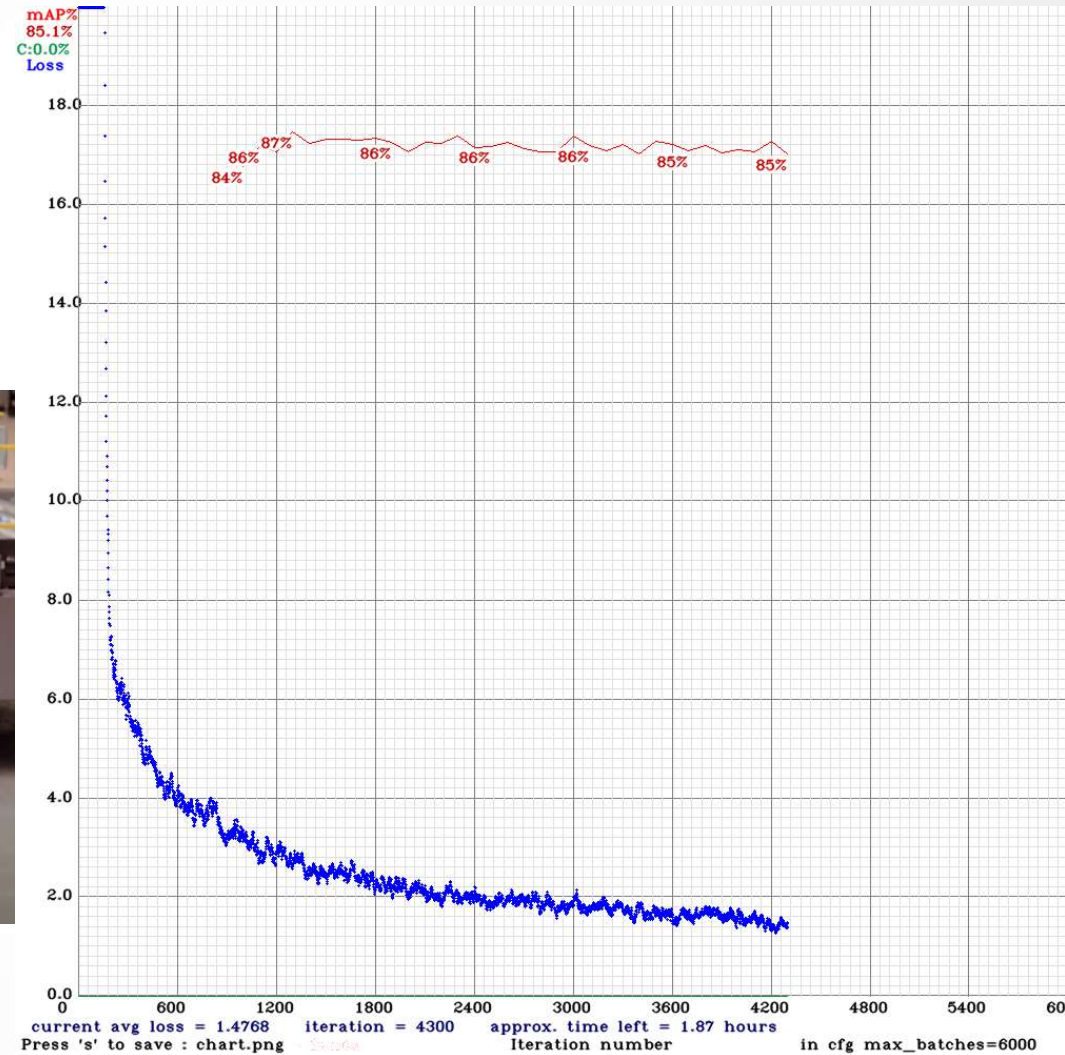
1. Have good accuracy & very fast.
2. Introduces skip connection (like Resnet) in YOLOv3 & v4, Can detect small objects (Darknet53)

Use Cases

1. Pizza on conveyor belt: Original Darknet weights
2. Tire on Conveyor belt
3. Defective cup detection

Tire

1. Downloaded 1500 tire images from Google images dataset
2. Trained upto 4000 epochs.



Defective Cup

1. Downloaded 300 good & defective cup images, manually labeled
2. Trained for 2 classes up to 4000 epochs.
3. Reduced loss below 2,
And mAP over 85%.

Time: 16:27:45

defective_cups detected in this frame: 1
cups detected in this frame: 1



defective_cup: 0.75



Time: 14:22:09

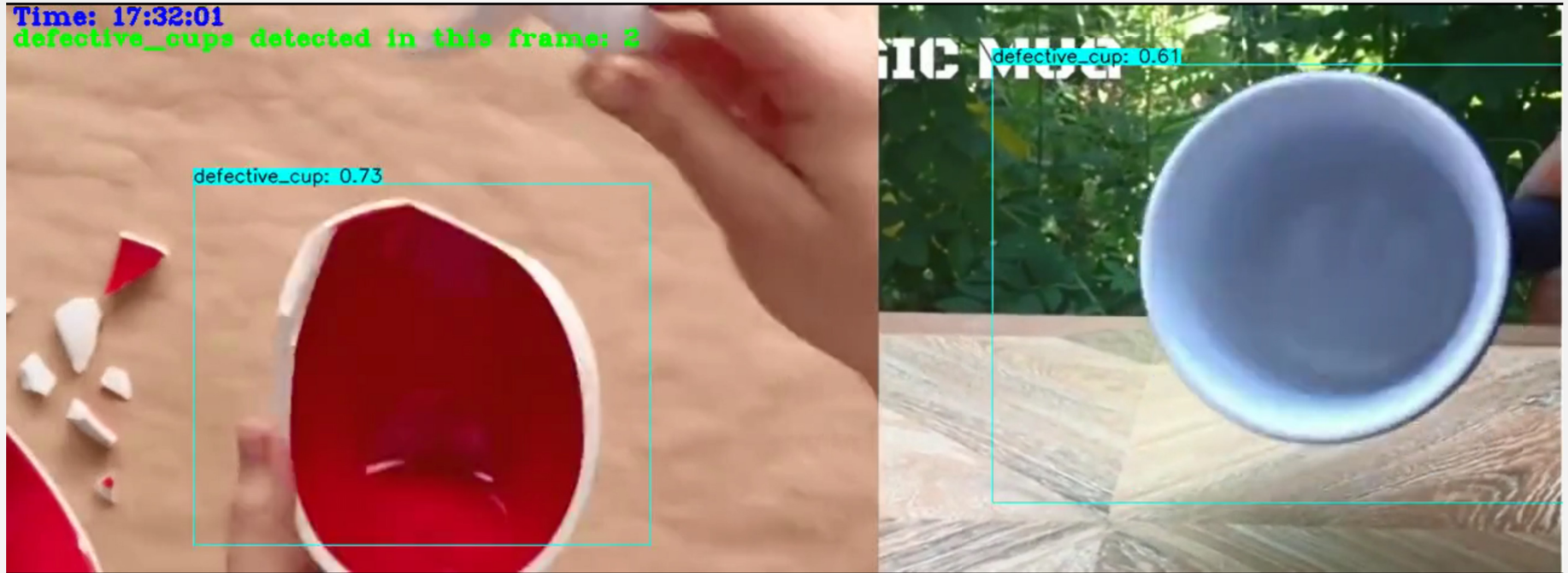
cups detected in this frame: 1
defective_cups detected in this frame: 1



cup: 0.92



False Positive



False positive (good cups identified as broken cups): if cups kept upside down, or the Handle not visible then it thinks as broken.

How to reduce: tuning threshold, training with specific use case images.

Usually false negative (broken cups identified as good cups) cases are more critical. Thankfully, false negatives are very low in my predictions.

Thank You!