Report 5

CSE541 Computer Vision Section-1

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Comparison of RetinaNet with Faster-RCNN:

>>> RetinaNet has low accuracy in terms of detecting smaller objects, occluded objects, and truncated objects. So we tried to implement Faster-RCNN which has more accuracy than RetinaNet (Author links open overlay panel Onur Can Koyun a et al., “Focus-and-detect: A small object detection framework for aerial images,” Signal Processing: Image Communication).

Results:

RetinaNet:

Image 1

Image 2

Faster-RCNN:

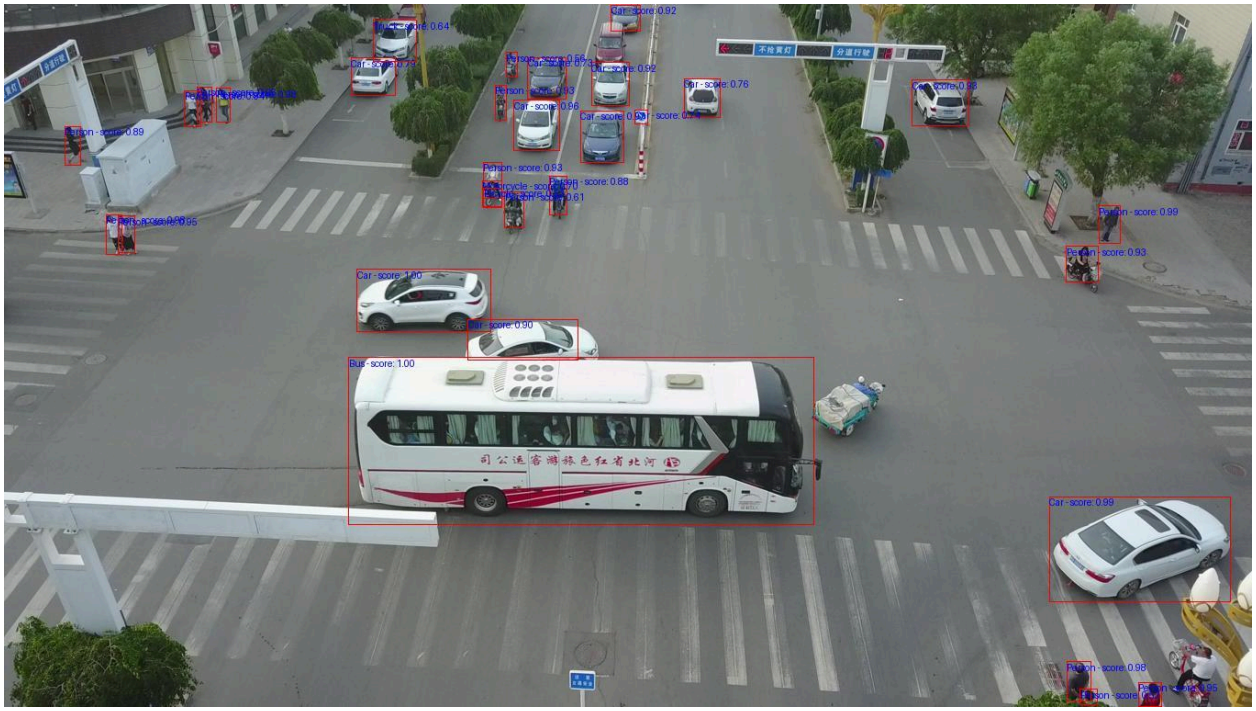
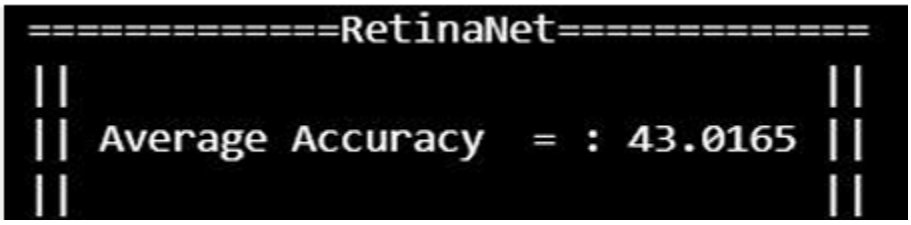
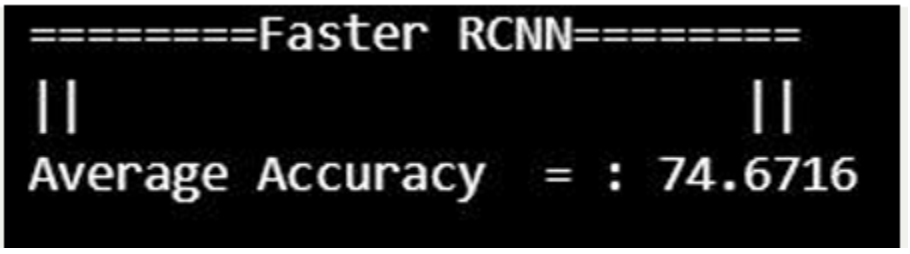


Image 3

Image 4

Accuracy:





Conclusion and Summary:

>>> From the results that we got, we can conclude that Faster-RCNN is more effective than RetineNet in terms of detecting small objects. Faster-RCNN is even more efficient

in detecting occluded objects, too. By comparing image 1 and image 3 we can see the difference that Faster-RCNN effectively detects the person riding a bike and can also differentiate the person and bike. Moreover, Faster-RCNN is 74.67% accurate on the Visdrone-2019 dataset, while RetinaNet is 43.01% accurate. With this, we can conclude that faster-RCNN is better than RetinaNet for detecting small objects.

References:

Wikimedia Foundation. (2024, January 2). Small object detection. Wikipedia. https://en.wikipedia.org/wiki/Small_object_detection

Author links open overlay panel Onur Can Koyun a et al., “Focus-and-detect: A small object detection framework for aerial images,” Signal Processing: Image Communication, https://www.sciencedirect.com/science/article/pii/S0923596522000273 (accessed Apr. 8, 2024).

Tsung-Yi Lin, Priya Goyal, Ross Girshick, Kaiming He, and Piotr Dollár. Focal loss for dense object detection. In Proceedings of the IEEE international conference on computer vision, pages 2980–2988, 2017.

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