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Written by Lucas Kim

⚠ **Before Reading**

- My undergraduate major is not Computer Science.
- Only 'Basic' understanding of linear algebra, calculus, and probability and statistics.
- Might be wrong, feedback is welcome.
- Not yet capable of fully understanding all the papers cited as references.

For today, I would appreciate it if you could consider my goal to be grasping the big picture.

YOLOX

Conclusion

YOLOX summary

- YOLOv3 Base
- Used anchor-free
- Equipped with decoupled head and SimOTA
- Achieved the better performance
- Won first prize in CVPR 2021

Prerequisites

- Object detection
- YOLO Family
- SOTA
- Anchor-Free
- YOLO3
- Darknet53

Previous Problem

❌ Anchor-free, end-to-end(NMS-free) have not been integrated into YOLO yet
❌ OTA and OT problem
❌ Coupled head

Solution

✅ Anchor-free model
✅ SimOTA
✅ Decoupled head

Additional research

- Backbone
  Darknet53 -> Modified CSPNet

Performance Table

Method	Backbone	Size	FPS (V100)	AP (%)	AP_{50}	AP_{75}	AP_S	AP_M	AP_L
YOLOv3 + ASFF* [18]	Darknet-53	608	45.5	42.4	63.0	47.4	25.5	45.7	52.3
YOLOv3 + ASFF* [18]	Darknet-53	800	29.4	43.9	64.1	49.2	27.0	46.6	53.4
EfficientDet-D0 [28]	Efficient-B0	512	98.0	33.8	52.2	35.8	12.0	38.3	51.2
EfficientDet-D1 [28]	Efficient-B1	640	74.1	39.6	58.6	42.3	17.9	44.3	56.0
EfficientDet-D2 [28]	Efficient-B2	768	56.5	43.0	62.3	46.2	22.5	47.0	58.4
EfficientDet-D3 [28]	Efficient-B3	896	34.5	45.8	65.0	49.3	26.6	49.4	59.8
PP-YOLOv2 [11]	ResNet50-vd-dcn	640	68.9	49.5	68.2	54.4	30.7	52.9	61.2
PP-YOLOv2 [11]	ResNet101-vd-dcn	640	50.3	50.3	69.0	55.3	31.6	53.9	62.4
YOLOv4 [1]	CSPDarknet-53	608	62.0	43.5	65.7	47.3	26.7	46.7	53.3
YOLOv4-CSP [30]	Modified CSP	640	73.0	47.5	66.2	51.7	28.2	51.2	59.8
YOLOv3-ultralytics[2]	Darknet-53	640	95.2	44.3	64.6	-	-	-	-
YOLOv5-M [7]	Modified CSP v5	640	90.1	44.5	63.1	-	-	-	-
YOLOv5-L [7]	Modified CSP v5	640	73.0	48.2	66.9	-	-	-	-
YOLOv5-X [7]	Modified CSP v5	640	62.5	50.4	68.8	-	-	-	-
YOLOX-DarkNet53	Darknet-53	640	90.1	47.4	67.3	52.1	27.5	51.5	60.9
YOLOX-M	Modified CSP v5	640	81.3	46.4	65.4	50.6	26.3	51.0	59.9
YOLOX-L	Modified CSP v5	640	69.0	50.0	68.5	54.5	29.8	54.5	64.4
YOLOX-X	Modified CSP v5	640	57.8	**51.2**	69.6	55.7	31.2	56.1	66.1

Reference

English ref

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