# **DynamicDet: A Unified Dynamic Architecture for Object Detection**

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# A. Pseudo code for dynamic detector

We present the pseudo code of training the adaptive router on Algorithm 1, and the dynamic inference on Algorithm 2.

```
Input: The dynamic detector constructed by the first backbone \mathcal{B}_1, the first neck and head \mathcal{D}_1, the second backbone \mathcal{B}_2, the second neck and head \mathcal{D}_2, the composite connection module \mathcal{G}, and the adaptive router \mathcal{R}. The median of the training loss difference between two detectors \Delta. Input images \mathbf{x}_i \in \mathbf{X} and the corresponding ground truths \overline{\mathbf{y}}_i \in \overline{\mathbf{Y}}. Training iteration T.

for i = 1, \ldots, T do

F_1 = \mathcal{B}_1(\mathbf{x}_i); // Extract the first multi-scale features.

\mathbf{y}_1 = \mathcal{D}_1(F_1); // Predict the detection results by the first detector.

\phi = \mathcal{R}(F_1); // Predict the difficulty score.

H = \mathcal{G}(F_1); // Embed the first multi-scale features.

F_2 = \mathcal{B}_2(\mathbf{x}_i, H); // Extract the enhanced multi-scale features based on the input image and the embedding of previous multi-scale features.

\mathbf{y}_2 = \mathcal{D}_2(F_2); // Predict the detection results by the second detector.

\mathcal{L} = ((1 - \phi)(\mathcal{L}_{det}(\mathbf{y}_1, \overline{\mathbf{y}}_i) - \Delta/2) + \phi(\mathcal{L}_{det}(\mathbf{y}_2, \overline{\mathbf{y}}_i) + \Delta/2)); // Loss.

update the parameters of adaptive router based on the gradient from loss \mathcal{L}.
```

end

Algorithm 1: Pseudo code of training the adaptive router on DynamicDet.

```
Input: The dynamic detector constructed by the first backbone \mathcal{B}_1, the first neck and head \mathcal{D}_1, the second backbone \mathcal{B}_2, the second neck and head \mathcal{D}_2, the composite connection module \mathcal{G}, and the adaptive router \mathcal{R}. Input image \mathbf{x}. Threshold \tau.

Output: Predicted detection results \mathbf{y}

F_1 = \mathcal{B}_1(\mathbf{x}); // Extract the first multi-scale features.

\phi = \mathcal{R}(F_1);// Predict the difficulty score.

if \phi \leq \tau then

// Easy image.

\mathbf{y} = \mathcal{D}_1(F_1);// Predict the detection results by the first detector.

else

// Hard image.

H = \mathcal{G}(F_1);// Embed the first multi-scale features.

F_2 = \mathcal{B}_2(\mathbf{x}, H);// Extract the enhanced multi-scale features based on the input image

and the embedding of previous multi-scale features.

\mathbf{y} = \mathcal{D}_2(F_2);// Predict the detection results by the second detector.

end
```

#### Algorithm 2: Pseudo code of dynamic inference on DynamicDet.

# **B.** Additional results

#### **B.1.** More comparison on real-time object detection

We present more precision results (e.g., AP<sub>50</sub>) to compare with other real-time object detectors in Tab. 4.

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Model	Size	FLOPs	FPS	AP	AP <sub>50</sub>	AP <sub>75</sub>	APs	AP <sub>M</sub>	$AP_L$
EAutoDet-S [6]	640	24.9G	$120^{\dagger}$	40.1	58.7	43.5	21.7	43.8	50.5
EAutoDet-M [6]	640	60.8G	$70^{\dagger}$	45.2	63.5	49.1	25.7	49.1	57.3
EAutoDet-L [6]	640	115.4G	$59^{\dagger}$	47.9	66.3	52.0	28.3	52.0	59.9
EAutoDet-X [6]	640	225.3G	$41^{\dagger}$	49.2	67.5	53.6	30.4	53.4	61.5
EfficientDet-D0 [4]	512	2.5G	$98^{\dagger}$	34.6	53.0	37.1	-	-	-
EfficientDet-D1 [4]	640	6.1G	$74^{\dagger}$	40.5	59.1	43.7	-	-	-
YOLOX-S [1]	640	26.8G	$102^{\dagger}$	40.5	-	-	-	-	-
YOLOX-M [1]	640	73.8G	$81^{\dagger}$	47.2	-	-	-	-	-
YOLOX-L [1]	640	155.6G	$69^{\dagger}$	50.1	-	-	-	-	-
YOLOX-X [1]	640	281.9G	$58^{\dagger}$	51.5	-	-	-	-	-
YOLOv5-N (r6.2) [2]	640	4.5G	200	28.1	46.2	29.4	12.8	31.3	35.4
YOLOv5-S (r6.2) [2]	640	16.5G	196	37.7	57.3	40.5	19.8	41.7	47.4
YOLOv5-M (r6.2) [2]	640	49.0G	137	45.4	64.3	49.2	26.3	49.9	56.4
YOLOv5-L (r6.2) [2]	640	109.1G	114	49.0	67.5	53.1	29.8	53.4	61.2
YOLOV5-X (r6.2) [2]	640	205./G	100	50.9	69.2	55.1	31.9	55.2	63.6
YOLOv6-N [3]	640	11.1G	216	36.4	51.9	39.2	15.5	39.5	50.6
10L000-1[5] VOL006-8[3]	640	50.7G	200	41.2	57.9	44.0	19.9	43.0 47.0	58.0
YOL Ov6-M [3]	640	82.2G	104	40.8	67.0	47.5 54 3	22.2	54.6	58.9 65.4
YOLOv6-L [3]	640	144.0G	76	52.3	69.9	56.8	31.6	57.2	67.8
PP-VOLOF+-S [7]	640	17.4G	208†	43.9	<u> </u>				
PP-VOLOE+M[7]	640	19.0G	123	50.0		_	_	_	_
	640	110.1G	78	53.3	_	-	-	-	-
	640	206.60	/0 45 <sup>†</sup>	55.5	-	-	-	-	-
PP-10L0E+-X [/]	040	200.00	45	54.9	-	-	-	-	-
YOLOv7 [5]	640	104.7G	114	51.4	69.7 70 5	55.9 56 8	31.8	55.5	65.0 64.7
	040	112.40	110	52.1	70.5	50.0	55.5	55.9	04.7
Dv-VOLOv7 / 50	640	143 2G	96	533	717	58 1	34.9	57.0	65 4
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90	640 640	143.2G 174.0G	96 85	53.3 53.8	71.7	58.1 58 7	34.9 35 3	57.0 57.5	65.4 66 3
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100	640 640 640	143.2G 174.0G 181.7G	96 85 83	53.3 53.8 53.9	71.7 72.2 72.2	58.1 58.7 58.7	34.9 35.3 35.3	57.0 57.5 57.6	65.4 66.3 66.4
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5]	640 640 640 640	143.2G 174.0G 181.7G 189.9G	96 85 83 105	<b>53.3</b> <b>53.8</b> <b>53.9</b> 53.1	71.7           72.2           72.2           72.2           71.2	<b>58.1</b> <b>58.7</b> <b>58.7</b> 57.8	<b>34.9</b> <b>35.3</b> <b>35.3</b> 33.8	<b>57.0</b> <b>57.5</b> <b>57.6</b> 57.1	65.4 66.3 66.4 67.4
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10	640 640 640 640 640 640	143.2G 174.0G 181.7G 189.9G 201.7G	96 85 83 105 98	<b>53.3</b> <b>53.8</b> <b>53.9</b> 53.1 <b>53.3</b>	71.7           72.2           72.2           71.2           71.6	<b>58.1</b> <b>58.7</b> <b>58.7</b> 57.8 <b>58.0</b>	34.9 35.3 35.3 33.8 34.2	<b>57.0</b> <b>57.5</b> <b>57.6</b> 57.1 <b>57.1</b>	65.4 66.3 66.4 67.4 67.1
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 50	640 640 640 640 640 640 640	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 248.9G	96 85 83 105 98 78	<b>53.3</b> <b>53.8</b> <b>53.9</b> <b>53.1</b> <b>53.3</b> <b>54.4</b> <b>54.4</b>	71.7 72.2 72.2 71.2 71.6 72.7	58.1 58.7 58.7 57.8 58.0 59.3 59.3	34.9 35.3 35.3 33.8 34.2 36.0	57.0 57.5 57.6 57.1 57.1 58.0	65.4 66.3 66.4 67.4 67.1 67.7
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 50 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 100	640 640 640 640 640 640 640 640	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G	96 85 83 105 98 78 65 64	53.3 53.8 53.9 53.1 53.3 54.4 55.0 55.0	71.7 72.2 72.2 71.2 71.6 72.7 73.2 73.2	58.1 58.7 58.7 57.8 58.0 59.3 59.9 60.0	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 50 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 100	640 640 640 640 640 640 640 640	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G	96 85 83 105 98 78 65 64	53.3         53.8         53.9         53.1         53.3         54.4         55.0	71.7         72.2         72.2         71.2         71.6         72.7         73.2         73.2	58.1 58.7 58.7 57.8 58.0 59.3 59.9 60.0	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]	640         640 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup></td> <td><b>53.3</b> <b>53.8</b> <b>53.9</b> <b>53.1</b> <b>53.3</b> <b>54.4</b> <b>55.0</b> <b>55.0</b> <b>43.9</b> <b>43.9</b></td> <td>71.7           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           76.2           75.2</td> <td><b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6</td> <td>57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7</td> <td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5</td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G	96 85 83 105 98 78 65 64 56 <sup>†</sup>	<b>53.3</b> <b>53.8</b> <b>53.9</b> <b>53.1</b> <b>53.3</b> <b>54.4</b> <b>55.0</b> <b>55.0</b> <b>43.9</b> <b>43.9</b>	71.7           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           76.2           75.2	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]	640         640 <td>143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup></td> <td>53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         47.2</td> <td>71.7         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         62.7         65.9         62.4</td> <td><b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>52.2</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6</td> <td>57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7</td> <td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5</td>	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup>	53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         47.2	71.7         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         62.7         65.9         62.4	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>52.2</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]	640         640 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup></td> <td>53.3         53.8         53.9           53.1         53.3         54.4           55.0         55.0         43.9           47.2         49.7         49.7</td> <td>71.7         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         62.7         65.9         68.4</td> <td><b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6</td> <td>57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7</td> <td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5</td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup>	53.3         53.8         53.9           53.1         53.3         54.4           55.0         55.0         43.9           47.2         49.7         49.7	71.7         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         62.7         65.9         68.4	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]	640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         102         1024         1280         1280         1024         1280         1024         1280         1024         100	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 55.0G 135.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup>	<b>53.3</b> <b>53.8</b> <b>53.9</b> <b>53.1</b> <b>53.3</b> <b>54.4</b> <b>55.0</b> <b>55.0</b> <b>43.9</b> 47.2 49.7 51.5	71.7           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           62.7           65.9           68.4           70.5	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]           EfficientDet-D6 [4]	640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         1024         1280	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup>	53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6	71.7           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           62.7           65.9           68.4           70.5           71.5	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - -	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 50           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 90           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]           EfficientDet-D6 [4]           EfficientDet-D7 [4]	640         640         640         640         640         640         640         640         640         640         640         640         640         640         1024         1280         1280         1280         1536	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup>	53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6           53.7	71.7           72.2           72.2           71.2           71.6           72.7           73.2	<b>58.1</b> <b>58.7</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>56.1</b> <b>57.2</b> <b>58.4</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - -	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 50 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D6 [4] EfficientDet-D7 [4] EfficientDet-D7X [4]	640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         102         102         1280         1280         1280         1536	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup>	53.3         53.8         53.9         53.1         53.3         54.4         55.0         55.0         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1 <th< td=""><td>71.7           72.2           72.2           72.2           71.2           71.6           72.7           73.2           72.4           74.3</td><td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b></td><td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -</td><td>57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7</td><td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5</td></th<>	71.7           72.2           72.2           72.2           71.2           71.6           72.7           73.2           72.4           74.3	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D6 [4] EfficientDet-D7 [4] EfficientDet-D7X [4] YOLOv5-N6 (r6.2) [2]	640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         640         1280         1280         1280         1280         1536         1536         1536         1280         1280         1280         1536         1536         1536         1280         1280         1280         1280         1536         1536         1536         1280         1280         1280         1280         1536         1536         1280	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 18.4G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161	53.3         53.8         53.9           53.1         53.3         54.4           55.0         55.0         55.0           43.9         47.2         49.7           51.5         52.6         53.7           55.1         36.2         36.2	71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>39.0</b> <b>39.0</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 	57.0 57.5 57.6 57.1 57.1 58.0 58.6 58.7	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5 - - - - - - - - - - - - - - - - - - -
Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] YOLOV5-N6 (r6.2) [2] YOLOV5-S6 (r6.2) [2]	640         540         540         540         540         540         540         540 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.5C</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152</td> <td><b>53.3</b> <b>53.8</b> <b>53.9</b> <b>53.1</b> <b>53.3</b> <b>54.4</b> <b>55.0</b> <b>55.0</b> <b>43.9</b> <b>47.2</b> <b>49.7</b> <b>51.5</b> <b>52.6</b> <b>53.7</b> <b>55.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>36.2</b> <b>44.6</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> <b>51.1</b> 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    62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           63.9</td> <td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> 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    73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           63.9	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> <b>25.1</b> 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Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]           EfficientDet-D5 [4]           EfficientDet-D7 [4]           EfficientDet-D7 [4]           EfficientDet-D7 [4]           YOLOv5-N6 (r6.2) [2]           YOLOv5-M6 (r6.2) [2]           YOLOv5-M6 (r6.2) [2]           YOLOv5-M6 (r6.2) [2]           YOLOv5-M6 (r6.2) [2]	640         540         540         540         540         540         540 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152 96</td> <td>53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4</td> <td>71.7           72.2           72.2           72.2           71.2           71.6           72.7           73.2           72.4           74.3           55.0           63.9           69.7           71.2</td> <td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>56.0</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> - - - - - - - - - - - - -</td> <td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5 - - - - - - - - - - - - - - - - - - -</td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96	53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4	71.7           72.2           72.2           72.2           71.2           71.6           72.7           73.2           72.4           74.3           55.0           63.9           69.7           71.2	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>56.0</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> - - - - - - - - - - - - -	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5 - - - - - - - - - - - - - - - - - - -
Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 50 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] YOLOV5-N6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-L6 (r6.2) [2] YOLOV5-L6 (r6.2) [2]	640         540         540         540 <td>143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 830.2G</td> <td><math display="block">\begin{array}{r} 96\\ 85\\ 83\\ \hline 105\\ 98\\ 78\\ 65\\ 64\\ \hline 56^{\dagger}\\ 34^{\dagger}\\ 23^{\dagger}\\ 14^{\dagger}\\ 11^{\dagger}\\ 8^{\dagger}\\ 7^{\dagger}\\ \hline 161\\ 152\\ 96\\ 65\\ 20\\ \end{array}</math></td> <td>53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4           53.8           55.0</td> <td>71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           69.7           71.8           72.8</td> <td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>50.8</b></td> <td><b>34.9</b> <b>35.3</b> <b>35.3</b> <b>33.8</b> <b>34.2</b> <b>36.0</b> <b>36.6</b> <b>36.6</b> <b>36.6</b> <b>-</b> - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> - - - - - - - - - - - - -</td> <td><b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>65.0</b> <b>66.6</b> <b>8</b></td>	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 830.2G	$\begin{array}{r} 96\\ 85\\ 83\\ \hline 105\\ 98\\ 78\\ 65\\ 64\\ \hline 56^{\dagger}\\ 34^{\dagger}\\ 23^{\dagger}\\ 14^{\dagger}\\ 11^{\dagger}\\ 8^{\dagger}\\ 7^{\dagger}\\ \hline 161\\ 152\\ 96\\ 65\\ 20\\ \end{array}$	53.3           53.8           53.9           53.1           53.3           54.4           55.0           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4           53.8           55.0	71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           69.7           71.8           72.8	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>50.8</b>	<b>34.9</b> <b>35.3</b> <b>35.3</b> <b>33.8</b> <b>34.2</b> <b>36.0</b> <b>36.6</b> <b>36.6</b> <b>36.6</b> <b>-</b> - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> - - - - - - - - - - - - -	<b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>65.0</b> <b>66.6</b> <b>8</b>
Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           EfficientDet-D2 [4]           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]           EfficientDet-D7 [4]           EfficientDet-D7 [4]           EfficientDet-D7 [4]           YOLOv5-N6 (r6.2) [2]           YOLOv5-S6 (r6.2) [2]           YOLOv5-M6 (r6.2) [2]           YOLOv5-L6 (r6.2) [2]           YOLOv5-K6 (r6.2) [2]           YOLOv5-K6 (r6.2) [2]	640         640 <td>143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152 96 65 39</td> <td>53.3         53.8         53.9           53.1         53.3         54.4           55.0         55.0         55.0           43.9         47.2         49.7           51.5         52.6         53.7           55.1         36.2         44.6           51.4         55.0         55.0</td> <td>71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           69.7           71.8           72.8</td> <td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.0</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>58.7</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>57.1</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>57.1</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>58.6</b> <b>58.7</b> <b>57.1</b> <b>58.6</b> <b>58.7</b> <b>57.1</b> <b>58.6</b> <b>58.7</b> <b>57.1</b> <b>58.6</b> <b>58.7</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> <b>57.6</b> 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Dy-YOLOv7 / 50           Dy-YOLOv7 / 90           Dy-YOLOv7 / 100           YOLOv7-X [5]           Dy-YOLOv7-X / 10           Dy-YOLOv7-X / 100           EfficientDet-D2 [4]           EfficientDet-D3 [4]           EfficientDet-D4 [4]           EfficientDet-D5 [4]           EfficientDet-D5 [4]           EfficientDet-D7 [4]           EfficientDet-D7 [4]           YOLOv5-N6 (r6.2) [2]           YOLOv5-S6 (r6.2) [2]           YOLOv5-K6 (r6.2) [2]           YOLOv7-K6 [5]           YOLOv7-K6 [5]           YOLOv7-K6 [5]	640         1280         1280         1280<	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96 65 39 78 78	53.3           53.8           53.9           53.1           53.3           54.4           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4           55.0	71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           69.7           71.8           72.8           72.6	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - 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Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 100 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] YOLOV5-N6 (r6.2) [2] YOLOV5-N6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV7-K6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5]	640         1280         1280         1280<	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 906.9C	$\begin{array}{c} 96\\ 85\\ 83\\ \hline 105\\ 98\\ 78\\ 65\\ 64\\ \hline 56^{\dagger}\\ 34^{\dagger}\\ 23^{\dagger}\\ 14^{\dagger}\\ 11^{\dagger}\\ 8^{\dagger}\\ 7^{\dagger}\\ \hline 161\\ 152\\ 96\\ 65\\ 39\\ \hline 78\\ 52\\ 41\\ \end{array}$	53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         55.0	71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           69.7           71.8           72.8           72.6           73.5           74.0	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.1</b> <b>61.2</b> <b>60.1</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.3</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.6</b> <b>61.6</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.5</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>39.3</b> <b>48.3</b> <b>55.2</b> <b>57.6</b> <b>58.5</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b>	<b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>65.0</b> <b>66.8</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.2</b> <b>67.1</b> <b>68.2</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.1</b> <b>67.5</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b> <b>67.1</b>
Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] YOLOV5-N6 (r6.2) [2] YOLOV5-N6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV7-K6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5]	640         1280         1280         1280<	143.2G 174.0G 181.7G 189.9G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96 65 39 78 52 41 33	53.3           53.8           53.9           53.1           53.3           54.4           55.0           43.9           47.2           49.7           51.5           52.6           53.7           55.1           36.2           44.6           51.4           55.0           54.9           56.0           56.6           56.8	71.7           72.2           72.2           72.2           72.2           71.2           71.6           72.7           73.2           73.2           73.2           62.7           65.9           68.4           70.5           72.4           74.3           55.0           63.9           69.7           71.8           72.8           72.6           73.5           74.0           74.0           74.4	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.1</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>59.8</b> <b>60.0</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>59.8</b> <b>60.0</b> <b>60.1</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.8</b> <b>62.1</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>39.3</b> 48.3 <b>55.2</b> <b>57.6</b> <b>58.5</b> <b>58.7</b> <b>58.7</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.5</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b> <b>60.1</b>	<b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>65.0</b> <b>66.8</b> <b>67.1</b> <b>67.1</b> <b>68.4</b> <b>67.1</b> <b>68.4</b> <b>67.5</b> <b>69.0</b> <b>69.0</b>
Dy-YOLOv7 / 50 Dy-YOLOv7 / 90 Dy-YOLOv7 / 100 YOLOv7-X [5] Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 10 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 90 Dy-YOLOv7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] YOLOv5-N6 (r6.2) [2] YOLOv5-N6 (r6.2) [2] YOLOv5-M6 (r6.2) [2] YOLOv5-K6 (r6.2) [2] YOLOv5-K6 (r6.2) [2] YOLOv5-K6 (r6.2) [2] YOLOv5-K6 (r6.2) [2] YOLOv7-K6 [5] YOLOv7-E6 [5] YOLOv7-E6E [5]	640         640 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152 96 65 39 78 52 41 33</td> <td>53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         55.0         54.9         56.0         56.8</td> <td>71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.5         74.0         74.4</td> <td><b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.1</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b></td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>59.4</b></td> <td><b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.4</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b></td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 55.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96 65 39 78 52 41 33	53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         55.0         54.9         56.0         56.8	71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.5         74.0         74.4	<b>58.1</b> <b>58.7</b> <b>57.8</b> <b>58.0</b> <b>59.3</b> <b>59.9</b> <b>60.0</b> <b>47.6</b> <b>51.2</b> <b>53.9</b> <b>56.1</b> <b>57.2</b> <b>58.4</b> <b>59.9</b> <b>39.0</b> <b>48.6</b> <b>56.0</b> <b>58.5</b> <b>59.8</b> <b>60.1</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.2</b> <b>61.5</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.2</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b> <b>61.1</b>	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>59.4</b>	<b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.4</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b> <b>7</b>
Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7X [4] YOLOV5-N6 (r6.2) [2] YOLOV5-N6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV7-K6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5] YOLOV7-K6 / 10 Dy-YOLOV7-W6 / 10	640         640 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G <b>384.2G</b> 480.8G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152 96 65 39 78 52 41 33 74 58</td> <td>53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         53.8         55.0</td> <td>71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.0         73.0</td> <td>58.1           58.7           57.8           58.0           59.3           59.9           60.0           47.6           51.2           53.9           56.1           57.2           58.4           59.9           39.0           48.6           56.0           58.5           59.8           60.1           61.2           61.8           62.1           60.4           61.4</td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>58.4</b> <b>59.3</b></td> <td><b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>67.1</b> <b>68.4</b> <b>69.5</b> <b>69.0</b> <b>66.6</b> <b>66.9</b></td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G <b>384.2G</b> 480.8G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96 65 39 78 52 41 33 74 58	53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         53.8         55.0	71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.0         73.0	58.1           58.7           57.8           58.0           59.3           59.9           60.0           47.6           51.2           53.9           56.1           57.2           58.4           59.9           39.0           48.6           56.0           58.5           59.8           60.1           61.2           61.8           62.1           60.4           61.4	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>58.4</b> <b>59.3</b>	<b>65.4</b> <b>66.3</b> <b>66.4</b> <b>67.1</b> <b>67.7</b> <b>68.2</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>68.5</b> <b>67.1</b> <b>68.4</b> <b>69.5</b> <b>69.0</b> <b>66.6</b> <b>66.9</b>
Dy-YOLOV7 / 50 Dy-YOLOV7 / 90 Dy-YOLOV7 / 100 YOLOV7-X [5] Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 10 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 90 Dy-YOLOV7-X / 100 EfficientDet-D2 [4] EfficientDet-D3 [4] EfficientDet-D4 [4] EfficientDet-D4 [4] EfficientDet-D5 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7 [4] EfficientDet-D7X [4] YOLOV5-N6 (r6.2) [2] YOLOV5-N6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV5-K6 (r6.2) [2] YOLOV7-K6 [5] YOLOV7-E6 [5] YOLOV7-E6 [5] YOLOV7-E6E [5] Dy-YOLOV7-W6 / 10 Dy-YOLOV7-W6 / 90	640         640 <td>143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G 384.2G 480.8G 577.4G</td> <td>96 85 83 105 98 78 65 64 56<sup>†</sup> 34<sup>†</sup> 23<sup>†</sup> 14<sup>†</sup> 11<sup>†</sup> 8<sup>†</sup> 7<sup>†</sup> 161 152 96 65 39 78 52 41 33 74 58 48</td> <td>53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         53.8         55.0         54.9         56.0         56.8         55.2         56.1         56.7</td> <td>71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.0         73.8         74.3</td> <td>58.1           58.7           57.8           58.0           59.3           59.9           60.0           47.6           51.2           53.9           56.1           57.2           58.4           59.9           39.0           48.6           56.0           58.5           59.8           60.1           61.2           61.8           62.1           60.4           61.4           62.1</td> <td>34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -</td> <td><b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>58.4</b> <b>59.3</b> <b>59.9</b></td> <td>65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5 - - - - - - - - - - - - - - - - - - -</td>	143.2G 174.0G 181.7G 201.7G 248.9G 296.1G 307.9G 11.0G 25.0G 135.0G 226.0G 325.0G 410.0G 18.4G 67.2G 200.0G 445.6G 839.2G 360.0G 515.2G 806.8G 843.2G 384.2G 480.8G 577.4G	96 85 83 105 98 78 65 64 56 <sup>†</sup> 34 <sup>†</sup> 23 <sup>†</sup> 14 <sup>†</sup> 11 <sup>†</sup> 8 <sup>†</sup> 7 <sup>†</sup> 161 152 96 65 39 78 52 41 33 74 58 48	53.3         53.8         53.9         53.1         53.3         54.4         55.0         43.9         47.2         49.7         51.5         52.6         53.7         55.1         36.2         44.6         51.4         53.8         55.0         54.9         56.0         56.8         55.2         56.1         56.7	71.7         72.2         72.2         72.2         71.2         71.6         72.7         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.2         73.0         73.8         74.3	58.1           58.7           57.8           58.0           59.3           59.9           60.0           47.6           51.2           53.9           56.1           57.2           58.4           59.9           39.0           48.6           56.0           58.5           59.8           60.1           61.2           61.8           62.1           60.4           61.4           62.1	34.9 35.3 35.3 33.8 34.2 36.0 36.6 36.6 - - - - - - - - - - - - - - - - - -	<b>57.0</b> <b>57.5</b> <b>57.6</b> <b>57.1</b> <b>57.1</b> <b>58.0</b> <b>58.6</b> <b>58.7</b> <b>58.7</b> <b>59.9</b> <b>60.1</b> <b>60.5</b> <b>58.4</b> <b>59.3</b> <b>59.9</b>	65.4 66.3 66.4 67.4 67.1 67.7 68.2 68.5 - - - - - - - - - - - - - - - - - - -

<sup>1</sup> The FPS marked with † are from the corresponding papers, and others are measured on the same machine with 1 NVIDIA V100 GPU.

Table 4. Comparison of the state-of-the-art real-time object detectors on COCO test-dev.

Model	Size	FLOPs	FPS	AP	AP <sub>50</sub>	AP <sub>75</sub>	APs	AP <sub>M</sub>	$AP_L$
Dy-YOLOv7/0	640	104.7G	114	51.1	69.5	55.6	31.5	55.2	64.5
Dy-YOLOv7 / 10	640	112.4G	110	52.1	70.5	56.8	33.3	55.9	64.7
Dy-YOLOv7 / 20	640	120.1G	106	52.5	71.0	57.3	34.1	56.2	64.9
Dy-YOLOv7/30	640	127.8G	102	52.9	71.3	57.6	34.5	56.5	65.0
Dy-YOLOv7 / 40	640	135.5G	99	53.1	71.6	57.9	34.7	56.8	65.2
Dy-YOLOv7 / 50	640	143.2G	96	53.3	71.7	58.1	34.9	57.0	65.4
Dy-YOLOv7 / 60	640	150.9G	93	53.5	71.9	58.3	35.1	57.2	65.5
Dy-YOLOv7 / 70	640	158.6G	91	53.6	72.0	58.5	35.2	57.4	65.7
Dy-YOLOv7 / 80	640	166.3G	88	53.7	72.1	58.6	35.3	57.5	66.0
Dy-YOLOv7/90	640	174.0G	85	53.8	72.2	58.7	35.3	57.5	66.3
Dy-YOLOv7 / 100	640	181.7G	83	53.9	72.2	58.7	35.3	57.6	66.4
Dy-YOLOv7-X / 0	640	189.9G	105	52.6	70.7	57.2	32.9	56.6	67.1
Dy-YOLOv7-X / 10	640	201.7G	98	53.3	71.6	58.0	34.2	57.1	67.1
Dy-YOLOv7-X / 20	640	213.5G	93	53.7	71.9	58.5	34.8	57.3	67.4
Dy-YOLOv7-X / 30	640	225.3G	86	53.9	72.2	58.8	35.3	57.5	67.4
Dy-YOLOv7-X / 40	640	237.1G	82	54.1	72.5	59.0	35.6	57.8	67.4
Dy-YOLOv7-X / 50	640	248.9G	78	54.4	72.7	59.3	36.0	58.0	67.7
Dy-YOLOv7-X / 60	640	260.7G	75	54.6	72.8	59.5	36.3	58.2	67.8
Dy-YOLOv7-X / 70	640	272.5G	70	54.7	72.9	59.6	36.4	58.3	67.8
Dy-YOLOv7-X / 80	640	284.3G	68	54.8	73.0	59.8	36.6	58.4	68.0
Dy-YOLOv7-X / 90	640	296.1G	65	55.0	73.2	59.9	36.6	58.6	68.2
Dy-YOLOv7-X / 100	640	307.9G	64	55.0	73.2	60.0	36.6	58.7	68.5
Dy-YOLOv7-W6/0	1280	360.0G	78	54.7	72.4	59.8	36.6	58.1	66.5
Dy-YOLOv7-W6 / 10	1280	384.2G	74	55.2	73.0	60.4	37.9	58.4	66.6
Dy-YOLOv7-W6/20	1280	408.3G	69	55.5	73.3	60.8	38.5	58.7	66.7
Dy-YOLOv7-W6/30	1280	432.5G	66	55.8	73.5	61.1	38.8	58.9	66.7
Dy-YOLOv7-W6/40	1280	456.6G	62	55.9	73.7	61.2	39.1	59.1	66.8
Dy-YOLOv7-W6 / 50	1280	480.8G	58	56.1	73.8	61.4	39.3	59.3	66.9
Dy-YOLOv7-W6 / 60	1280	505.0G	56	56.2	73.9	61.6	39.4	59.4	67.0
Dy-YOLOv7-W6 / 70	1280	529.1G	53	56.3	74.0	61.7	39.4	59.5	67.1
Dy-YOLOv7-W6 / 80	1280	553.3G	51	56.5	74.2	61.9	39.4	59.7	67.5
Dy-YOLOv7-W6 / 90	1280	577.4G	48	56.7	74.3	62.1	39.5	59.9	67.8
Dy-YOLOv7-W6 / 100	1280	601.6G	46	56.8	74.4	62.1	39.6	59.9	68.3

Table 5. Detailed results of dynamic YOLOv7 models on COCO test-dev.

#### **B.2.** More results for dynamic detectors

We present more results for our dynamic detector (*i.e.*, Dy-YOLOv7 with / 0, / 10, ..., / 100) in Tab. 5. It is observed that our dynamic detectors can obtain a wide range of trade-offs of different precision and speed by proposed variable-speed inference strategy. For instance, using the same weight with different thresholds for inference, our Dy-YOLOv7-W6 can achieve 54.7%~56.8% mAP with 78~46 FPS.

# C. Additional analyses

# C.1. Consistency of the inference time

To further demonstrate the consistency of the inference time between the validation set and the test set, we compare the inference time of Dy-YOLOv7-W6 on these two sets. Specifically, we calculate the thresholds on the validation set of different sizes (*i.e.*, 0.5k, 2k, 5k) and measure their inference time on the validation set and the test set. As shown in Fig. 11, it is observed that the inference time is consistent between these two sets when calculating the thresholds by 5k validation images, and is very close to the ideal case. Moreover, when the validation set's size decreases, the inference time consistency becomes slightly worse but is still acceptable.



Figure 11. Comparison of the inference time on the validation set and the test set under the different thresholds obtained from the validation set with different size.

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