

Evaluating the Performance of RT-DETR - Real Time DETection TRansformer for Individual Tree Detection in RGB images

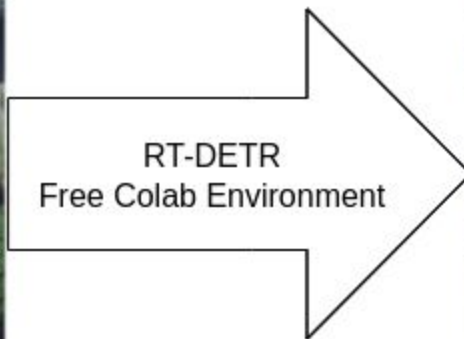
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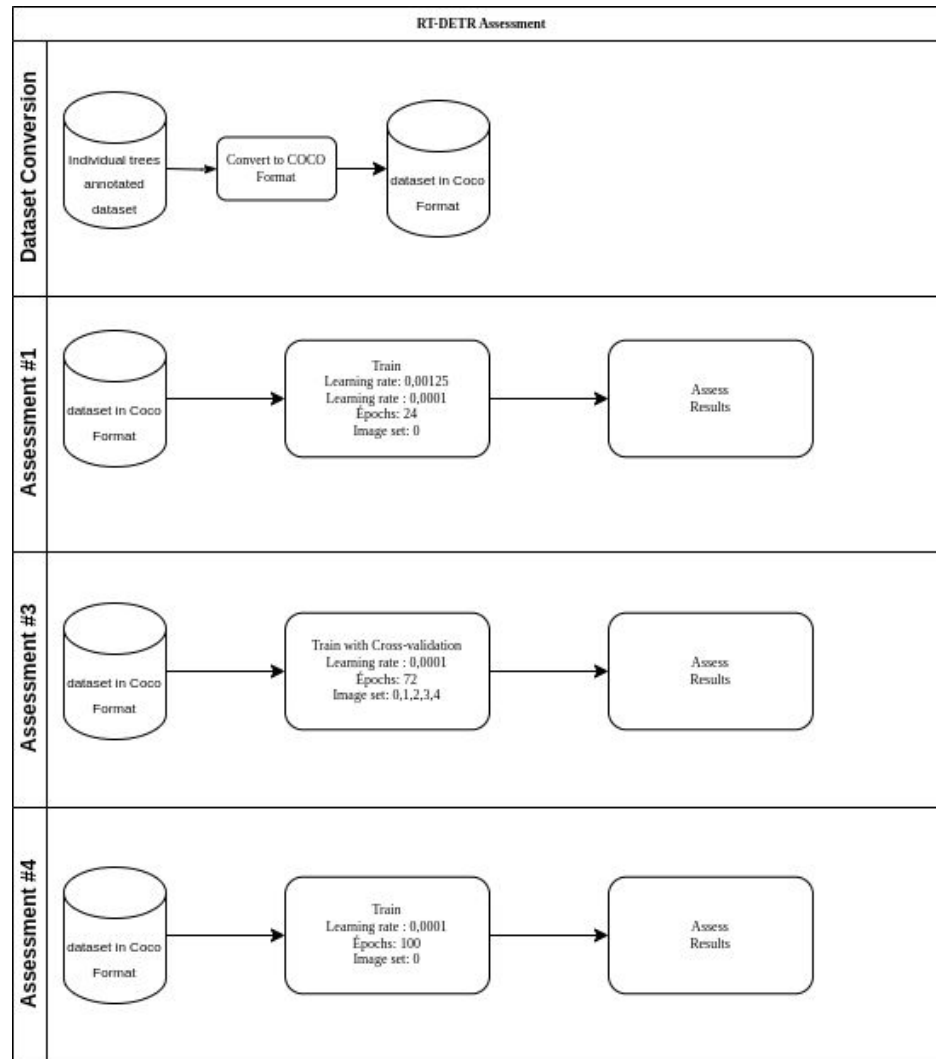
Objetivo



Modelo Escolhido

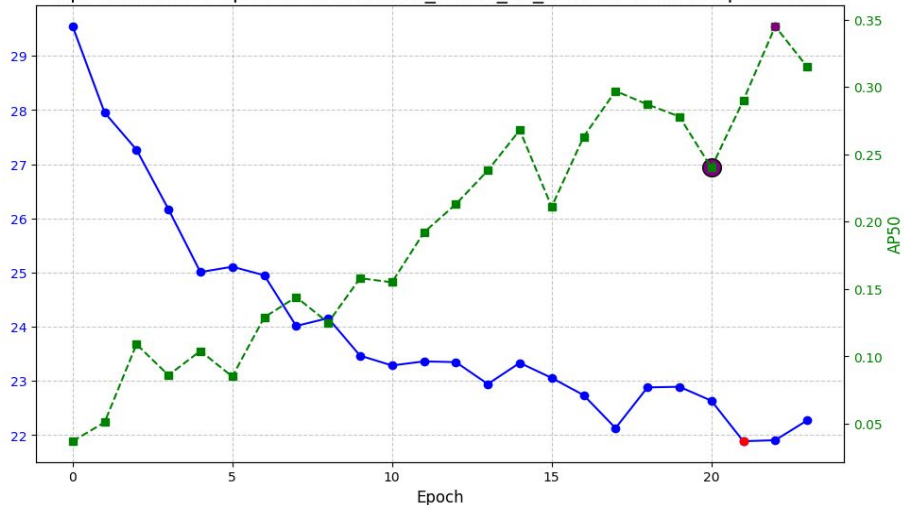
Model	Input shape	Dataset	AP^{val}	AP^{val}_{50}	Params(M)	FLOPs(G)	T4 TensorRT FP16(FPS)
RT-DETR-R18	640	COCO	46.5	63.8	20	60	217
RT-DETR-R34	640	COCO	48.9	66.8	31	92	161
RT-DETR-R50-m	640	COCO	51.3	69.6	36	100	145
RT-DETR-R50	640	COCO	53.1	71.3	42	136	108
RT-DETR-R101	640	COCO	54.3	72.7	76	259	74
RT-DETR-HGNetv2-L	640	COCO	53.0	71.6	32	110	114
RT-DETR-HGNetv2-X	640	COCO	54.8	73.1	67	234	74
RT-DETR-R18	640	COCO + Objects365	49.2	66.6	20	60	217
RT-DETR-R50	640	COCO + Objects365	55.3	73.4	42	136	108
RT-DETR-R101	640	COCO + Objects365	56.2	74.6	76	259	74
RT-DETRv2-S	640	COCO	48.1 (+1.6)	65.1	20	60	217
RT-DETRv2-M [*]	640	COCO	49.9 (+1.0)	67.5	31	92	161
RT-DETRv2-M	640	COCO	51.9 (+0.6)	69.9	36	100	145
RT-DETRv2-L	640	COCO	53.4 (+0.3)	71.6	42	136	108
RT-DETRv2-X	640	COCO	54.3	72.8 (+0.1)	76	259	74

Metodologia

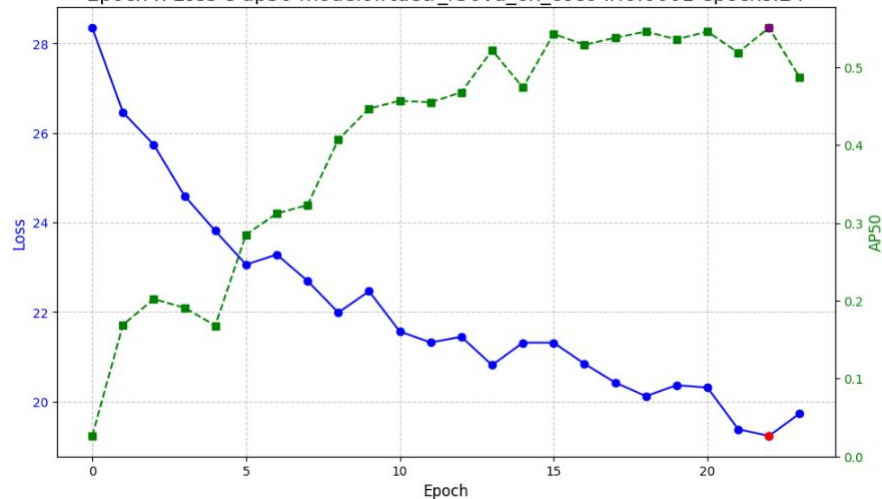


Experimento 1 : $lr = 0.00125/0.0001$, epochs = 24

Epoch x Loss e ap50 modelo:rtddetr_r50vd_6x_coco lr:0.00125 epochs:24



Epoch x Loss e ap50 modelo:rtddetr_r50vd_6x_coco lr:0.0001 epochs:24



Experimento 2 : $lr = 0,0001$, epochs = 72, image sets = 5

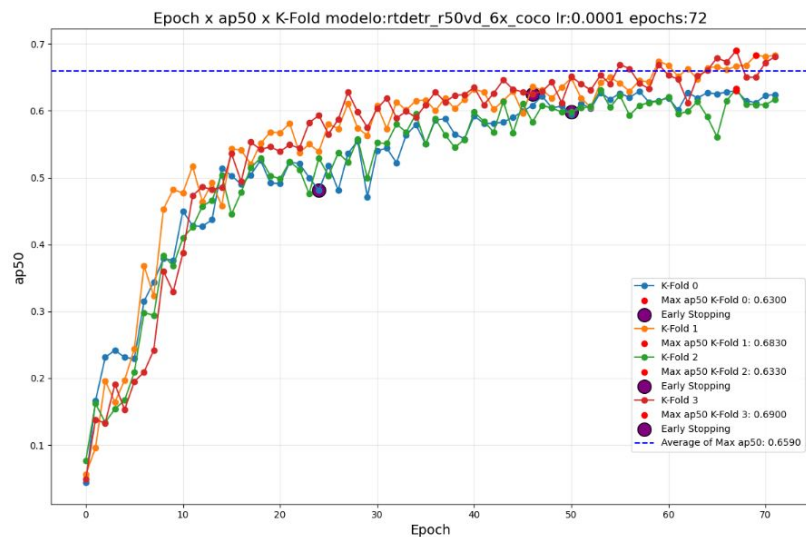


Image set	AP ₅₀
0	0.65800
1	0.64400
2	0.67200
3	0.64300
4	0.63400
Average	0.64400

Experimento 3 : $lr = 0,0001$, epochs = 100, image sets = 5

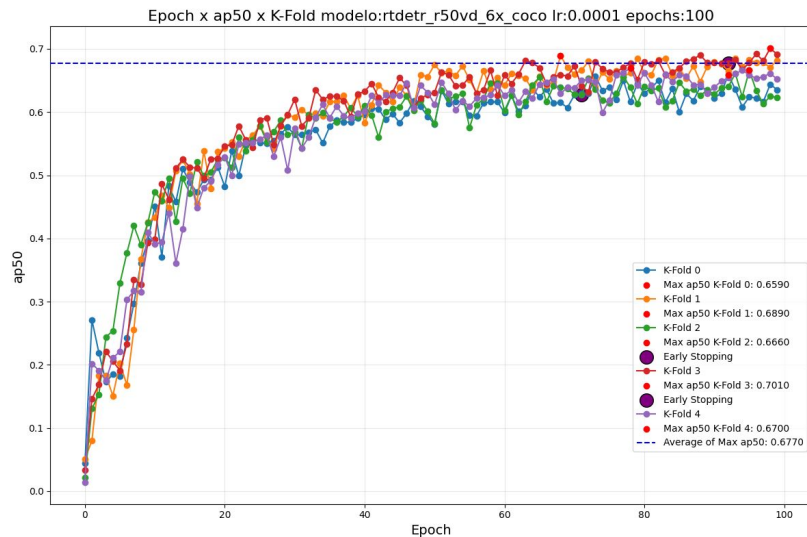


Image set	AP ₅₀
0	0.63700
1	0.64700
2	0.68200
3	0.64100
4	0.64600
Average	0.64600

Resumo

Exp.	Initial LR	Epochs	AP₅₀	Min. Patience
1	0,00125	24	-	-
2	0,00010	72	0,64400	3
3	0,00010	100	0,64600	4

Discussão

- Colab gratuito -> prova de conceito
- Learning rate inicial : fez grande diferença no resultado
- Número de épocas :
 - Melhorou desempenho para 72 épocas
 - Não houve melhoria para 100 épocas
 - Early stopping: não seria utilizado em nenhum treinamento com paciência = 4