

Aula 06 - Segmentação e Redes Generativas Adversárias

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Tópicos

- Classificação vs Segmentação
 - Classificação
 - Detecção de Objetos
 - Segmentação
- Redes Generativas Adversárias
 - DCGAN
 - PIX2PIX
- Codificação

Segmentação

Classificação vs Segmentação

Is this a dog?



Image Classification

What is there in image
and where?



Object Detection

Which pixels belong to
which object?

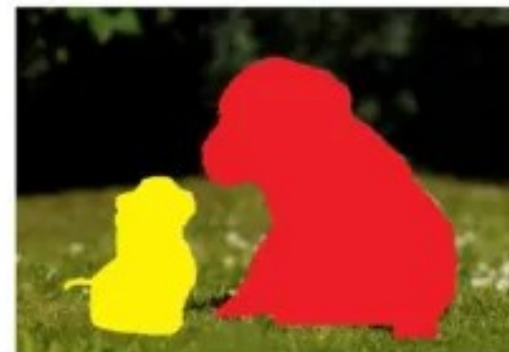
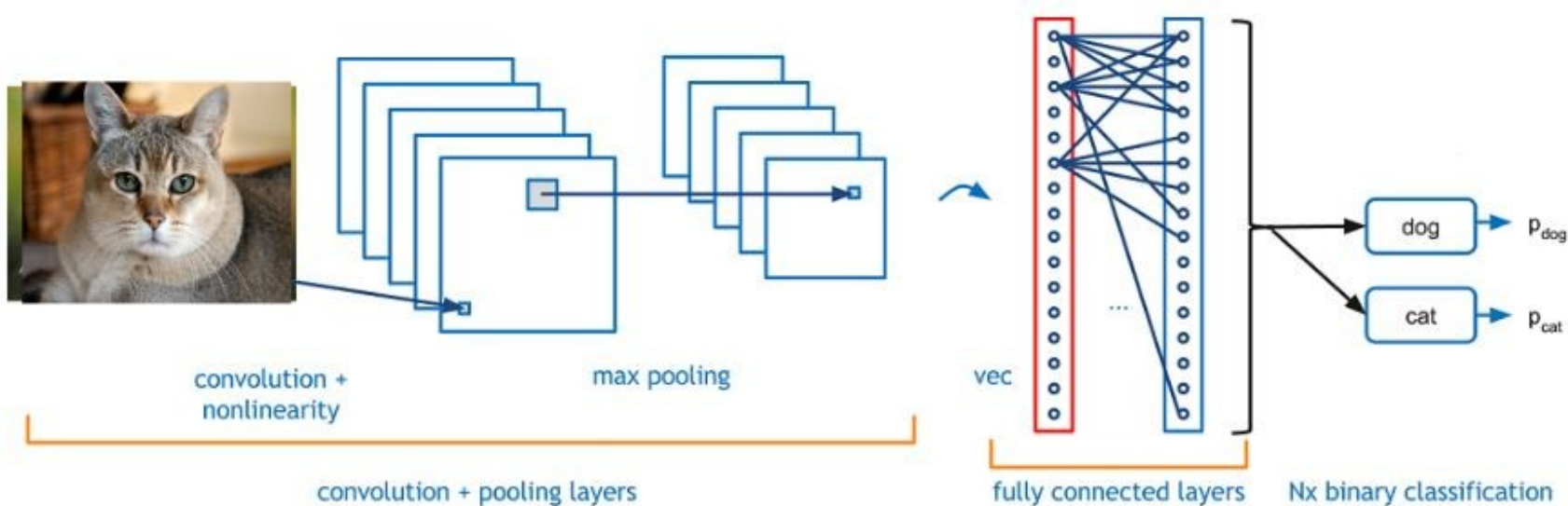


Image Segmentation

Classificação



Detecção de Objetos

Is this a dog?



Image Classification

What is there in image and where?



Object Detection

Which pixels belong to which object?

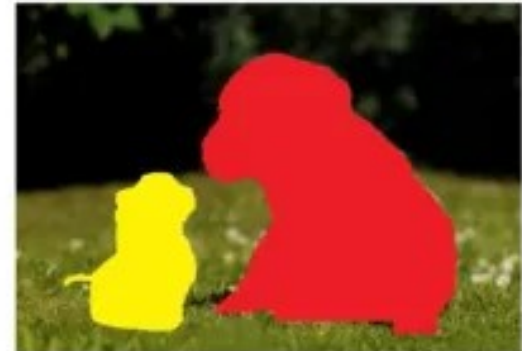
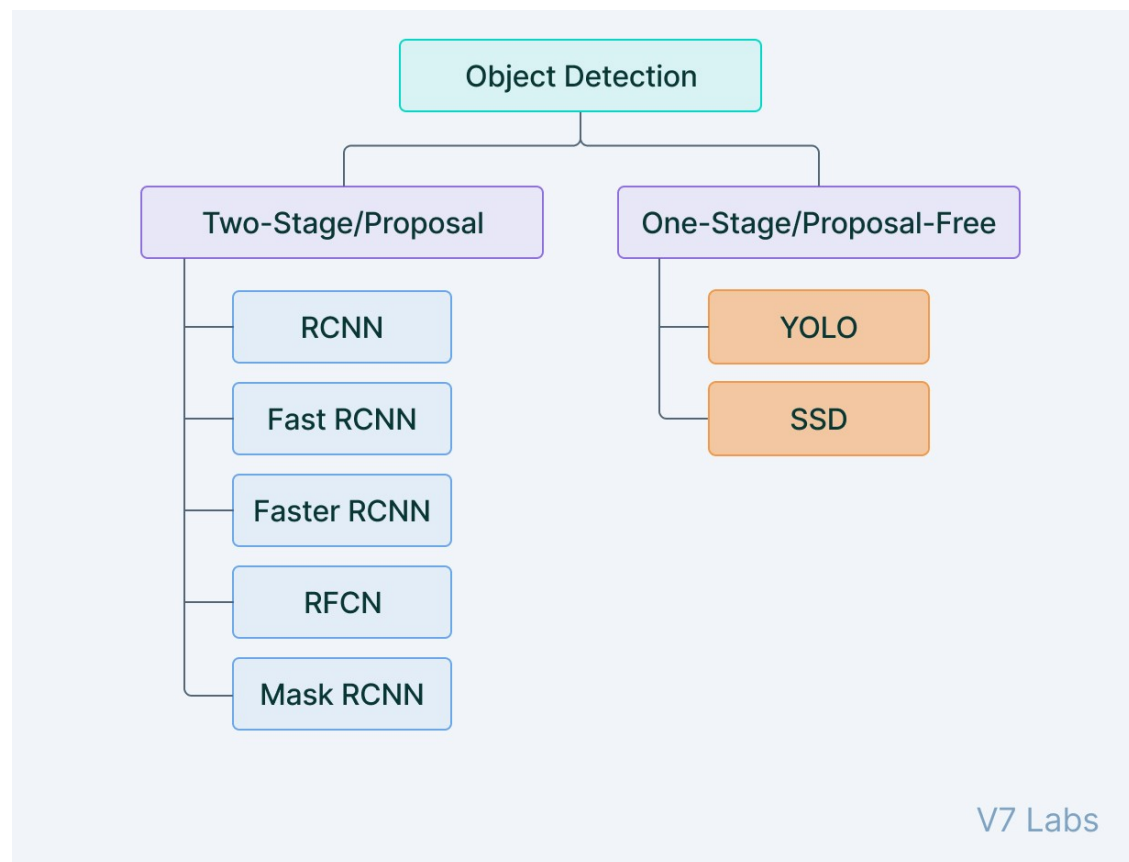
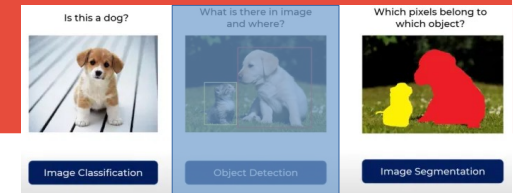
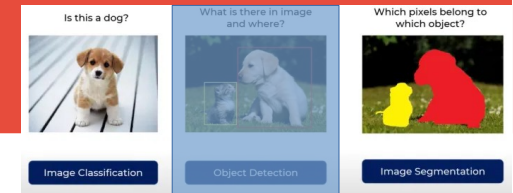


Image Segmentation

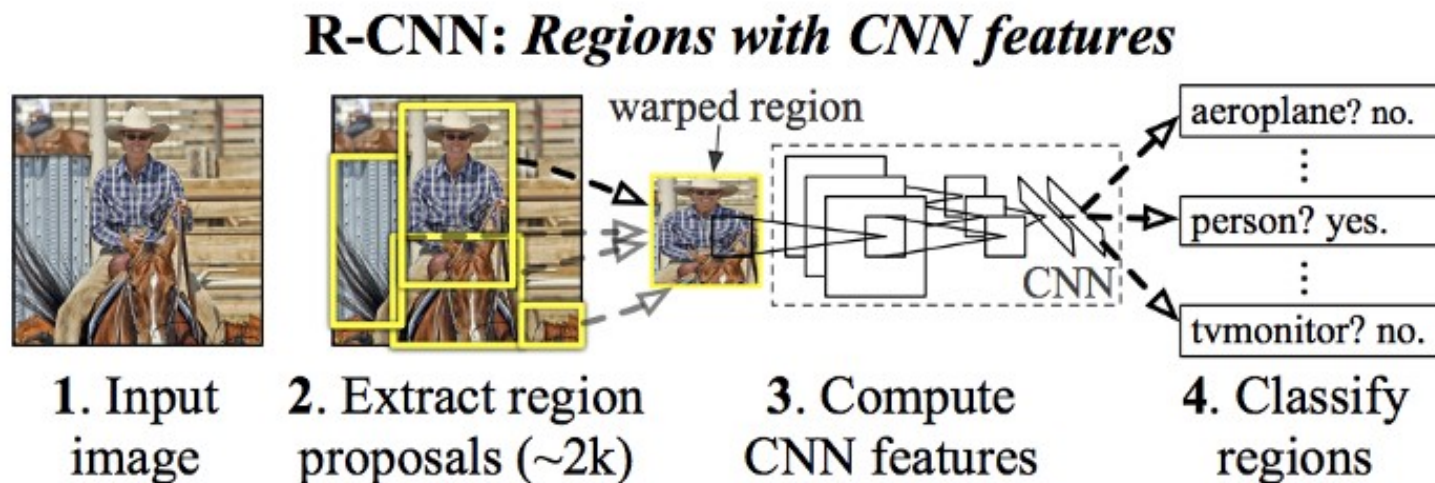
Detecção de Objetos



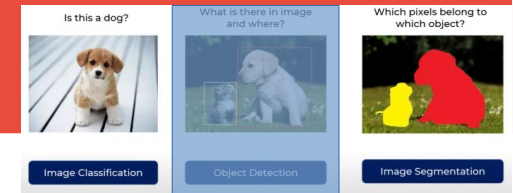
Detecção de Objetos - RCNN



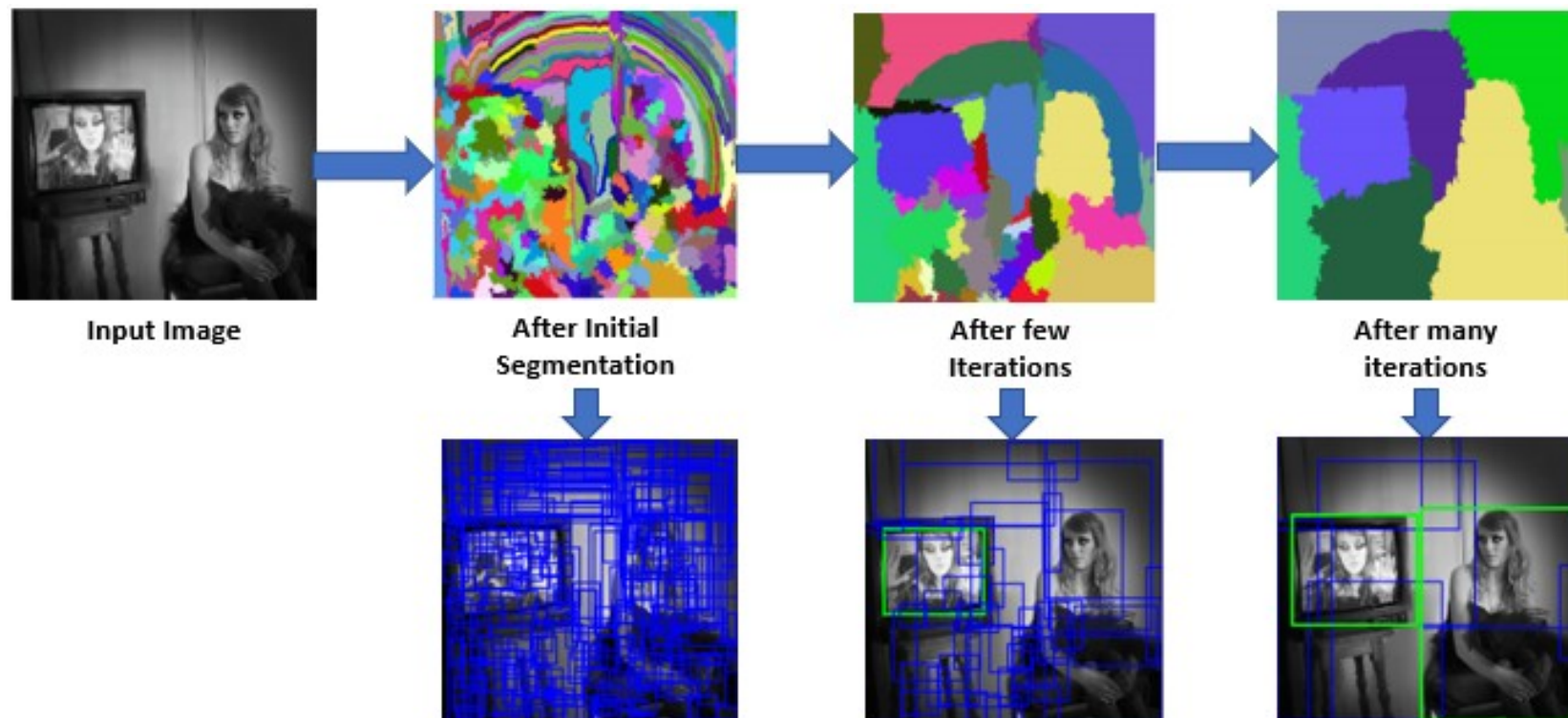
- Region Based Convolutional Neural Network (2014) - Ross Girshick
- Selective Search Algorithm (Region Proposal)
- CNN (Classification)



Detecção de Objetos - RCNN

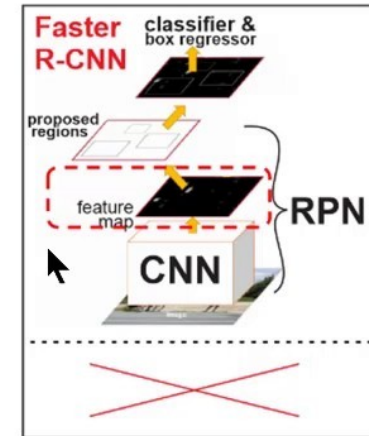
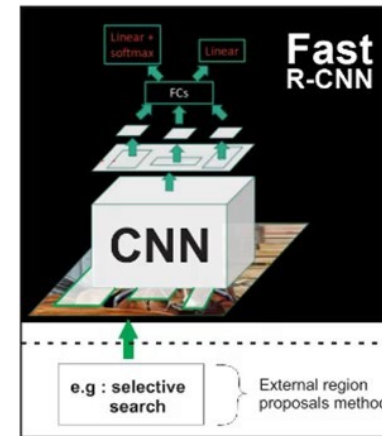
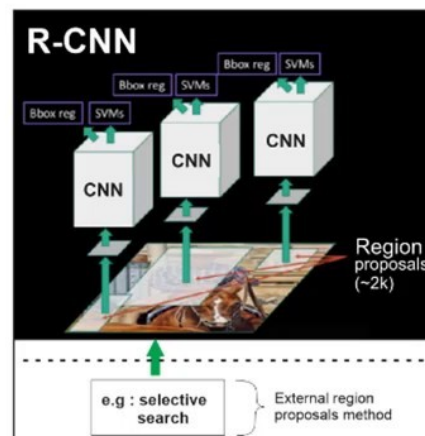
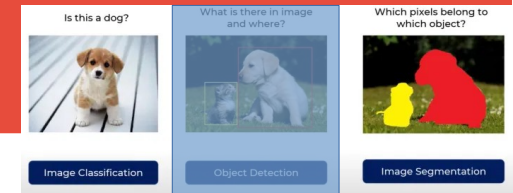


- Selective Search Algorithm (Region Proposal)



Detecção de Objetos - RCNN

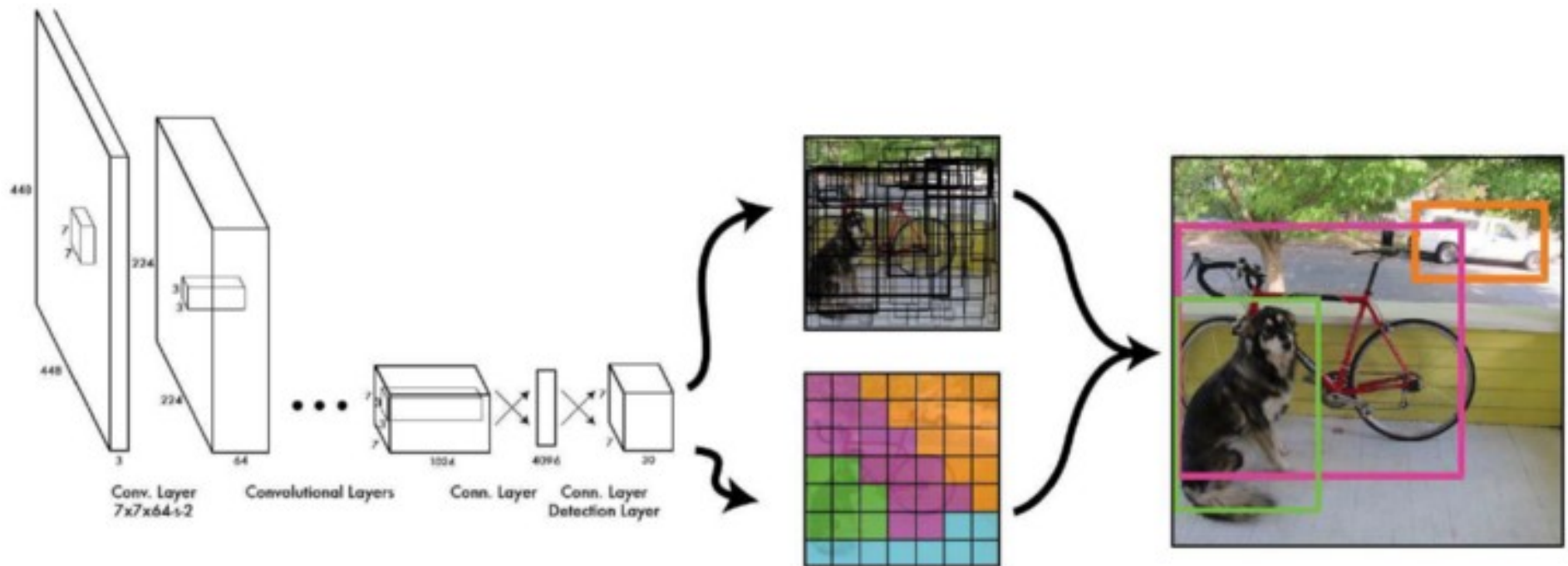
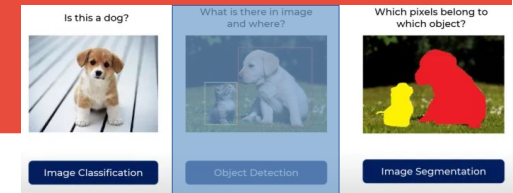
- R-CNN: Selective Search->CNN
- Fast: End-to-end (Sel. Search->ROI Pooling->FC)
- Faster: Region Proposal Network (RPN)



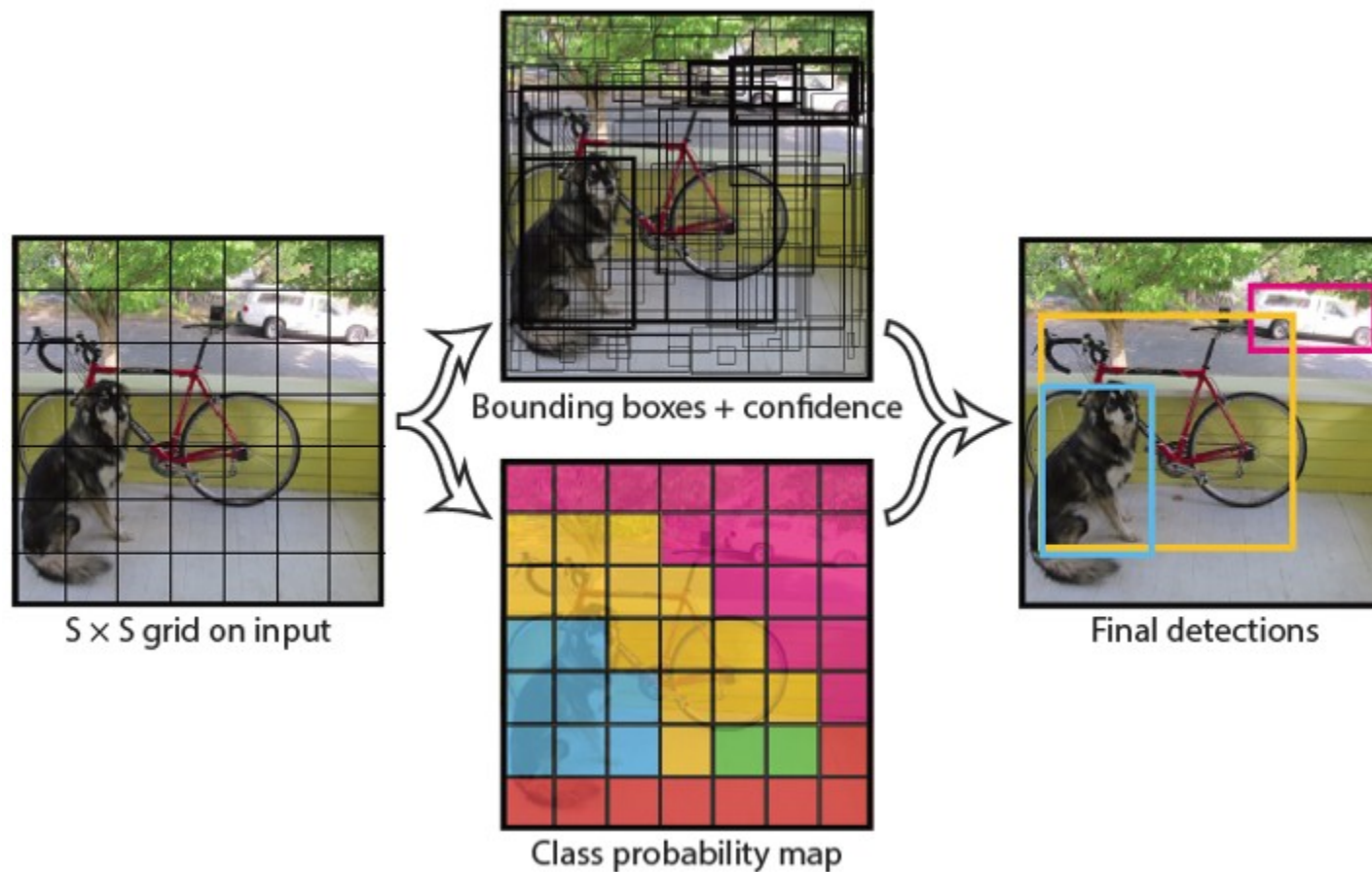
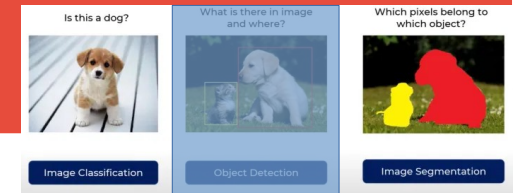
	R-CNN	Fast R-CNN	Faster R-CNN
Test time per image	50 seconds	2 seconds	0.2 seconds
Speed-up	1x	25x	250x
mAP (VOC 2007)	66.0%	66.9%	66.9%

Detecção de Objetos - Yolo

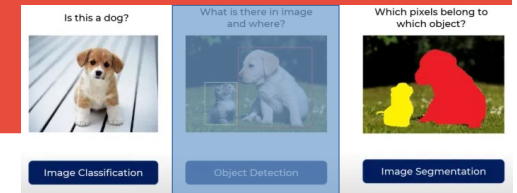
- You Look Once (2015)
- Joseph Redmon / Ross Girshick



Detecção de Objetos - Yolo



Let's Code



- YOLO Inference
 - COLAB [\[LINK\]](#)
 - CPU (local)
 - <https://github.com/Asadullah-Dal17/yolov4-opencv-python>

Segmentação

Is this a dog?



Image Classification

What is there in image
and where?



Object Detection

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which object?

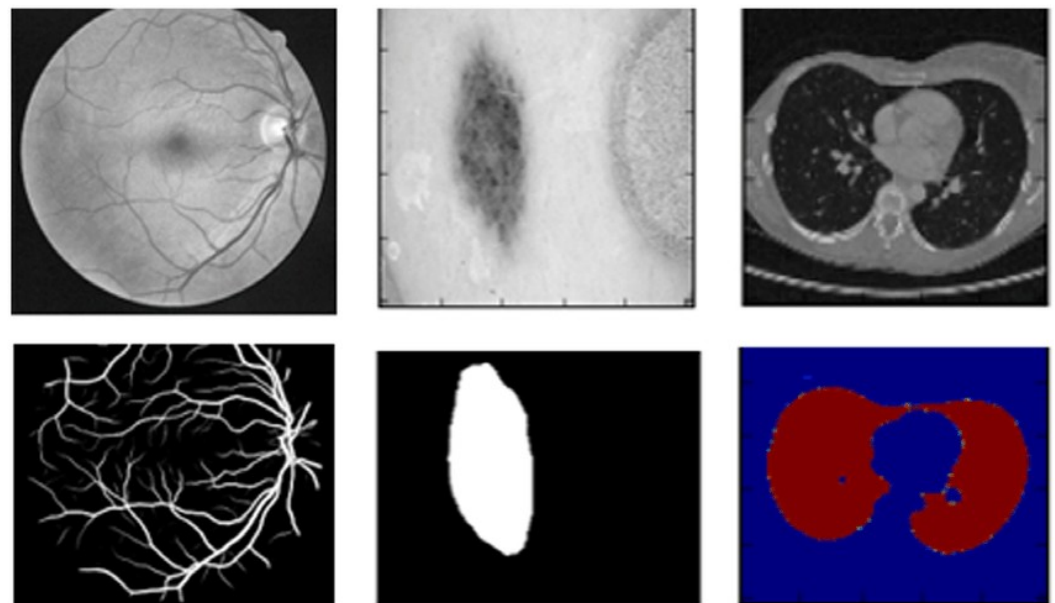
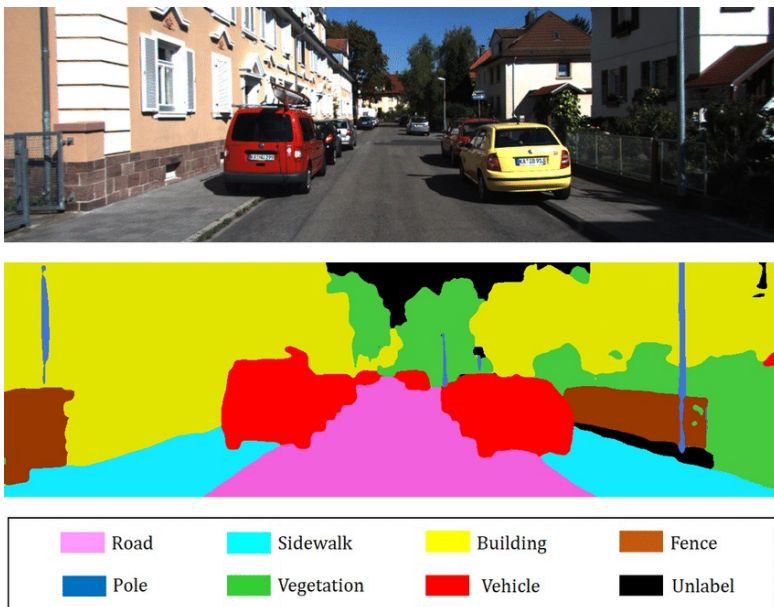


Image Segmentation

Segmentação



- Classificação a nível de pixel

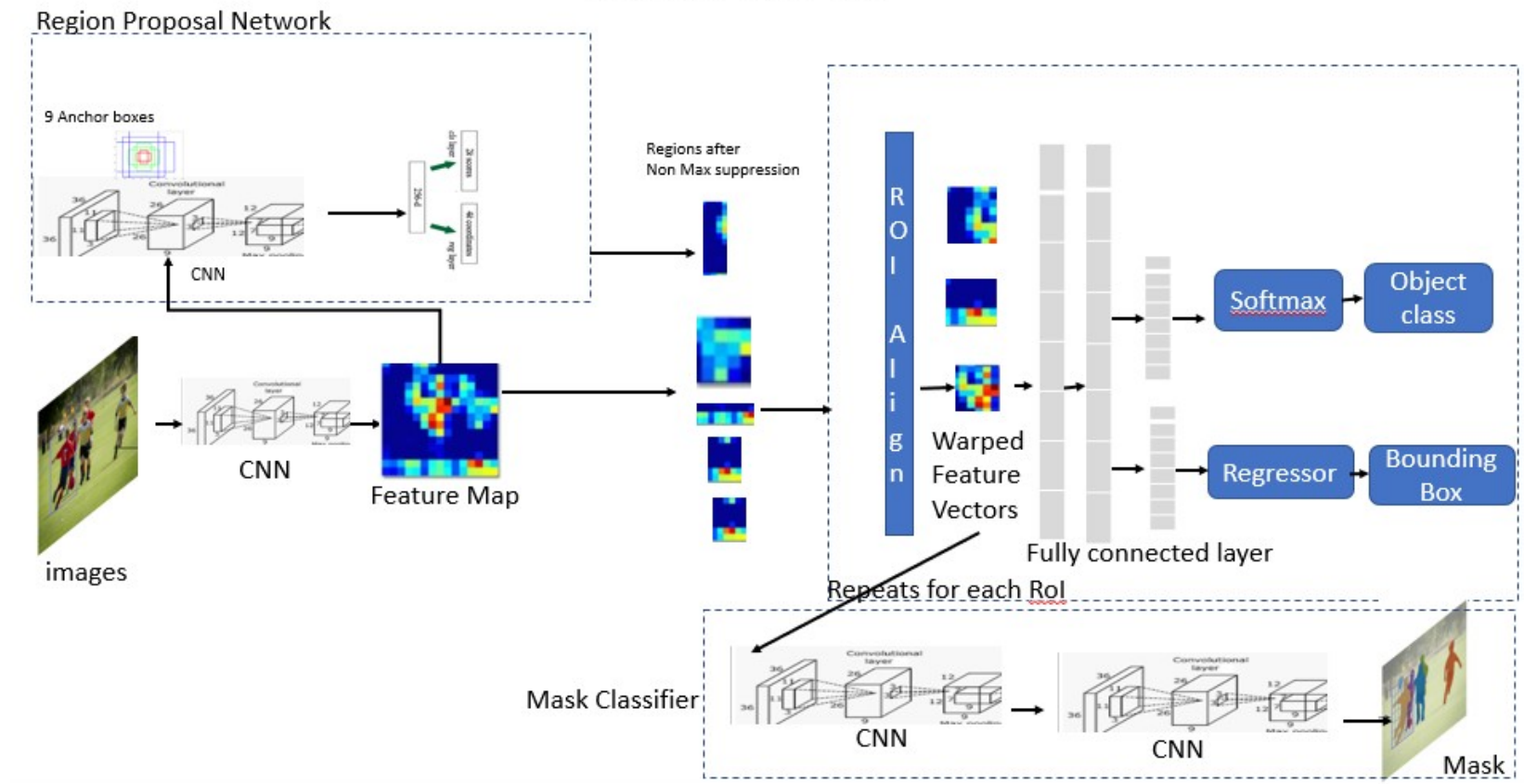


Segmentação - Mask RCNN

- Faster R-CNN with Binary Mask (2017)



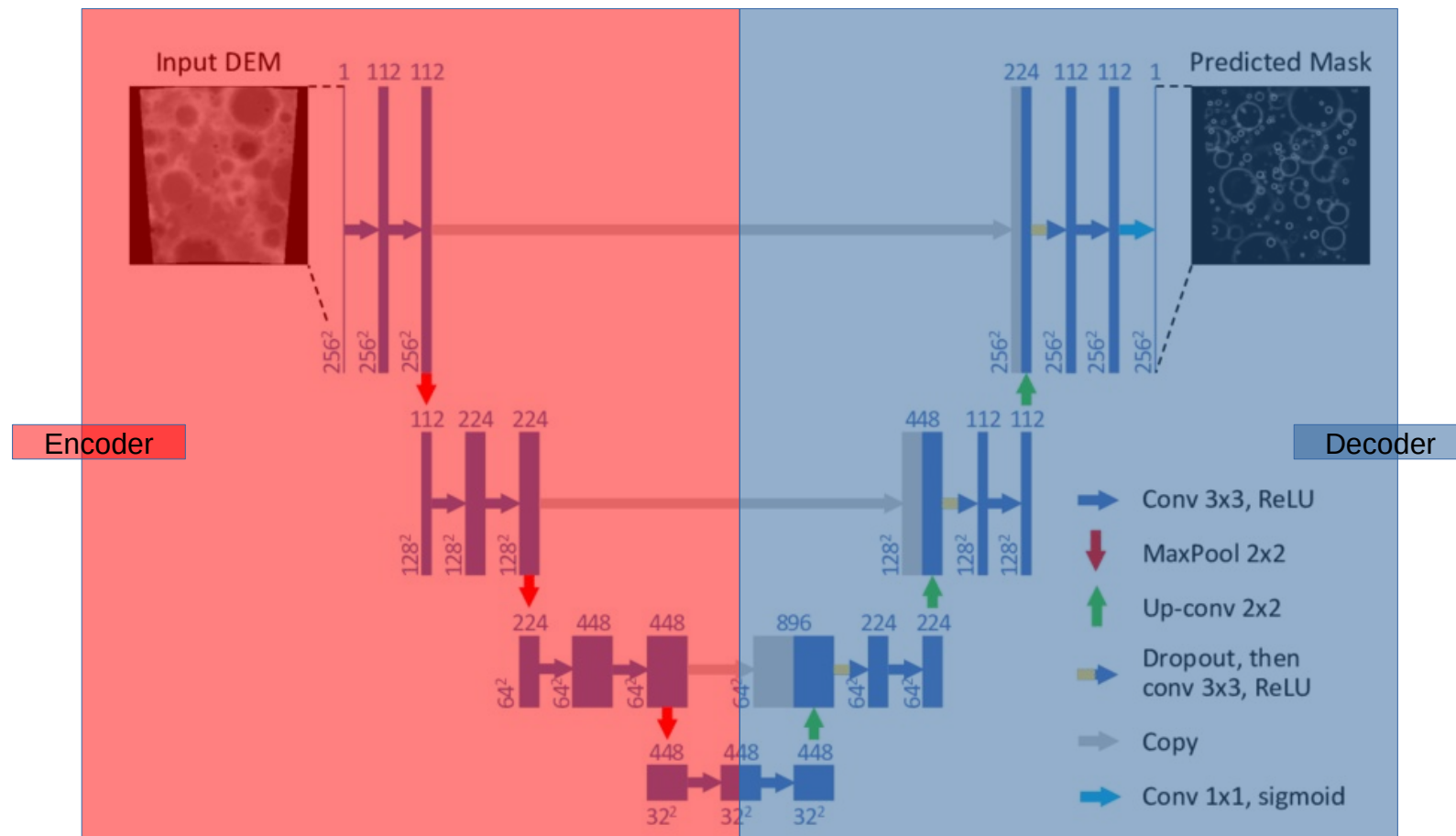
Mask RCNN



Segmentação - UNET



- U-Net (Encoder and Decoder)



Let's Code

- U-NET (Treino e Inferência)
- [\[LINK\]](#)

