

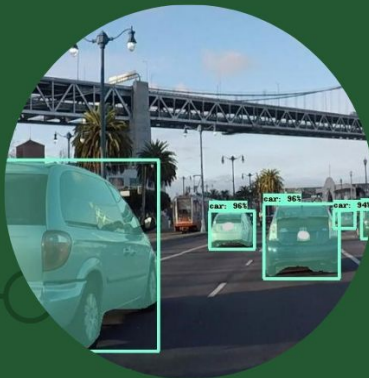
O INSTITUTO DE CIÊNCIA E
TECNOLOGIA APRESENTA



1º Workshop de Inteligência Artificial
do ICT-UNIFESP

Reconhecimento de objetos em Imagens: Uma Abordagem de Aprendizado Profundo

Jamil Anderson Mansur
Willy Thiago Gutsche



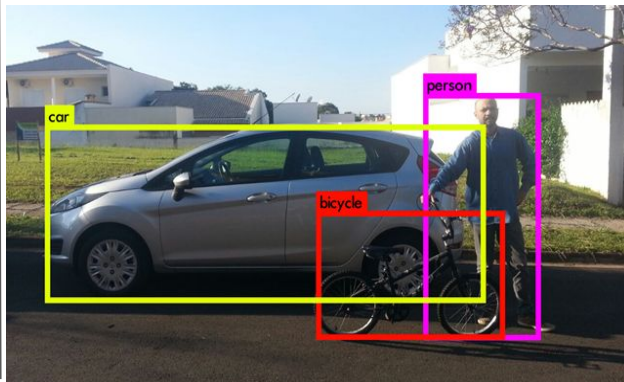
Foco de estudo

- Arquiteturas de reconhecimento de objetos em imagens
- Foco na arquitetura YOLO

YOLO

Motivação

- Entender a importância de se processar imagens e suas dificuldades
- Compreender as aplicações da técnica no mundo real



Desafios

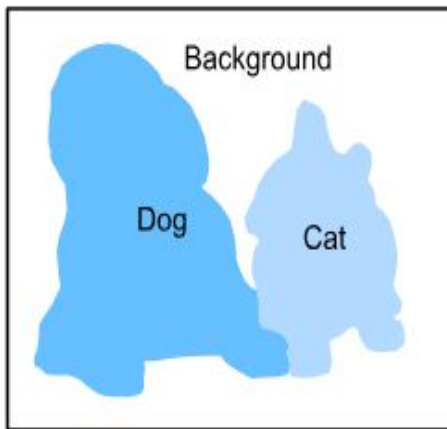
- Compreender a construção das arquiteturas
- Compreender a construção dos bancos de dados



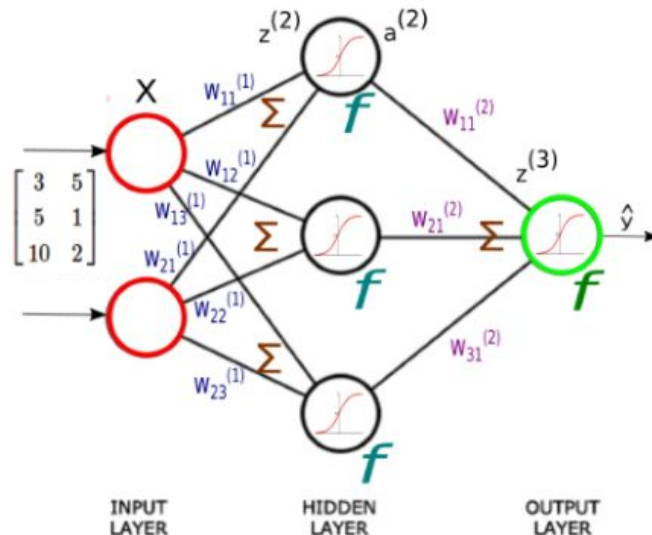
1. Resize image.
2. Run convolutional network.
3. Non-max suppression.

Desejamos compreender a formulação e as tecnologias por trás da YOLO e entender o motivo de seu destaque na área

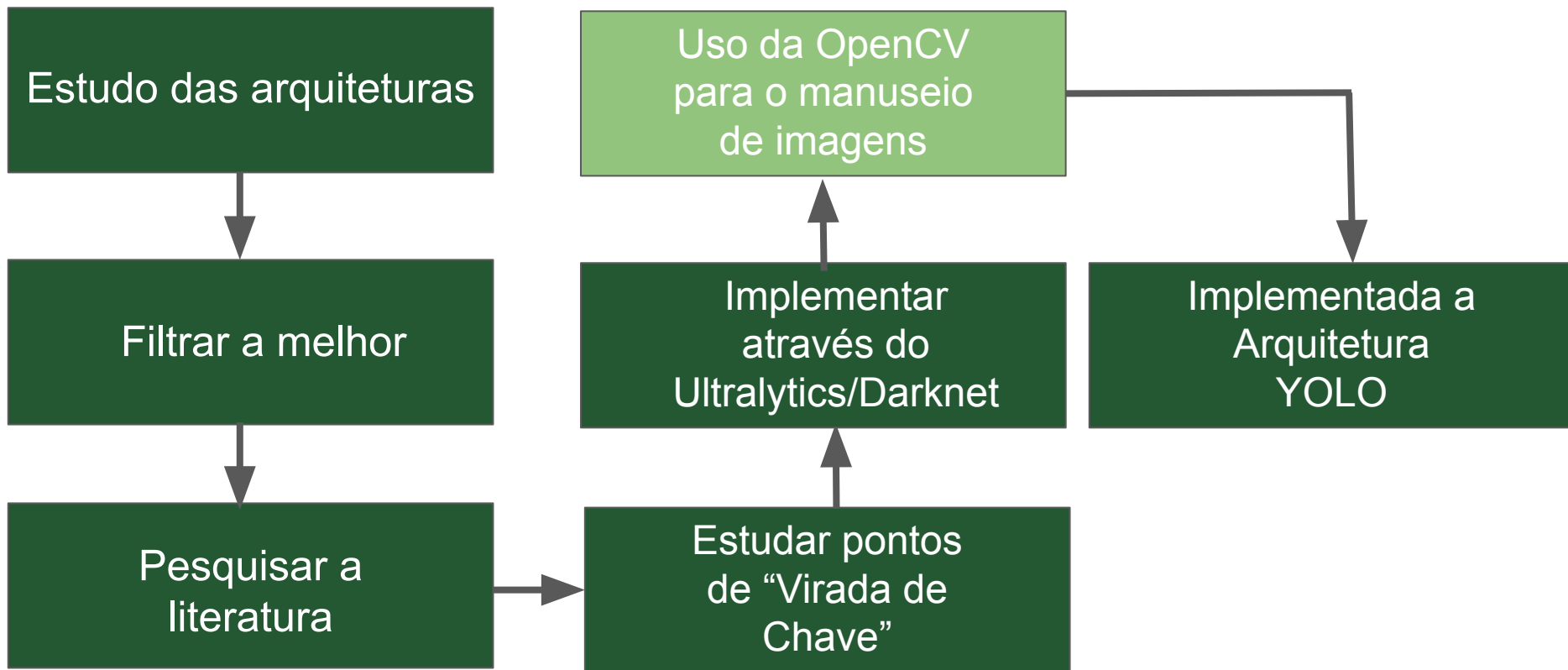
- Técnicas de pré-processamento de imagens



- Treinamento e otimização de modelos

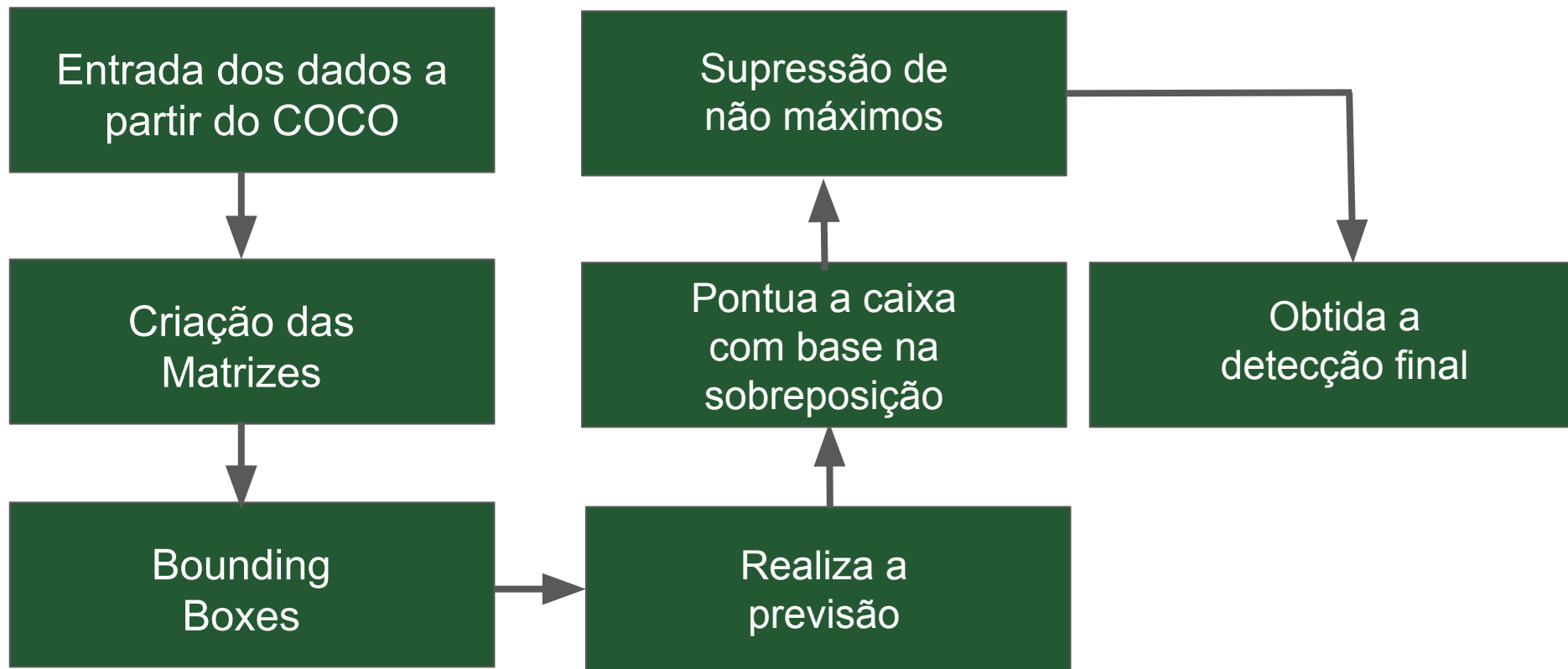


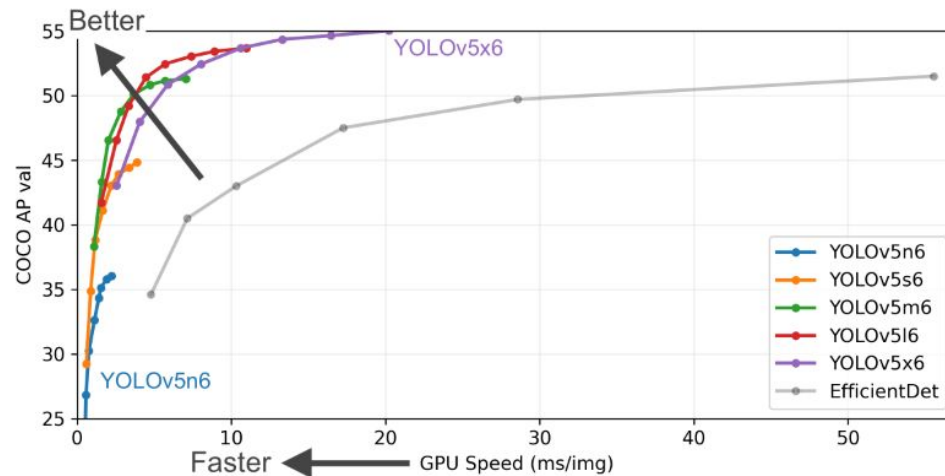
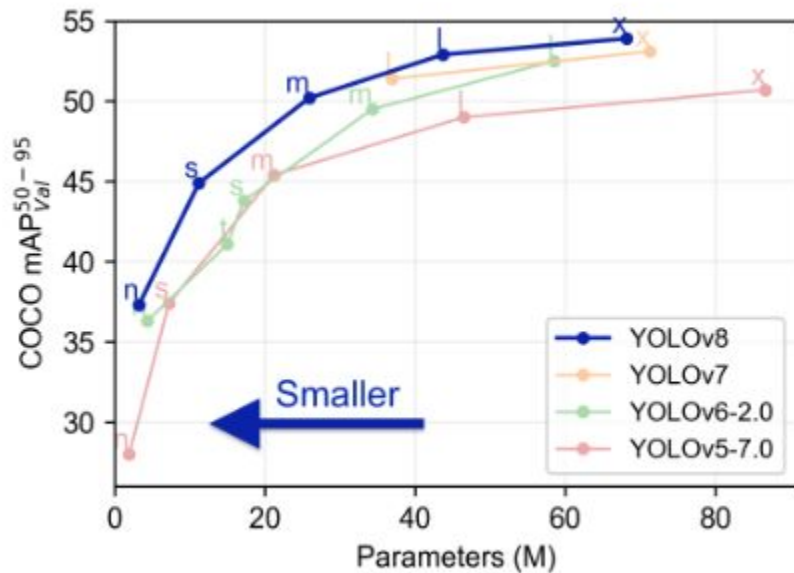
PIPELINE PROCESSUAL



- **BackBone**
 - Espinha Dorsal, pré treinada
 - **Camada intermediária**
 - Feature Pyramid Network
 - Redimensionamento de imagem
 - Divisão da imagem em células
 - **Camada de Detecção**
 - Bounding Boxes
 - Cada célula na grade de detecção prevê múltiplas caixas delimitadoras
 - **Camada de Saída**
 - Realiza o pós processamento para realizar a previsão final
 - Non-maximum suppression

PIPELINE YOLO





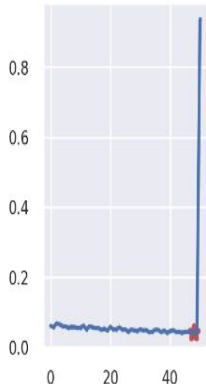
train/box_loss
0.03364



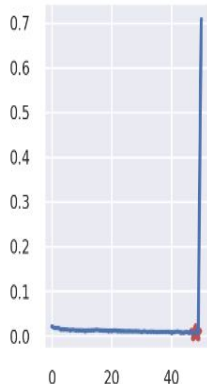
train/seg_loss
0.03477



train/obj_loss
0.04152



train/cls_loss
0.0078



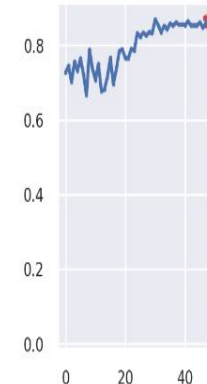
metrics/precision(B)
0.91262



metrics/recall(B)
0.86679



metrics/precision(M)
0.86899



metrics/recall(M)
0.81155



val/box_loss
0.02903



val/seg_loss
0.02533



val/obj_loss
0.02175



val/cls_loss
0.00277



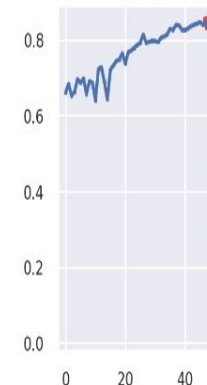
metrics/mAP 0.5(B)
0.93619



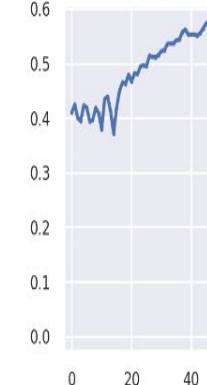
metrics/mAP 0.5:0.95(B)
0.70623



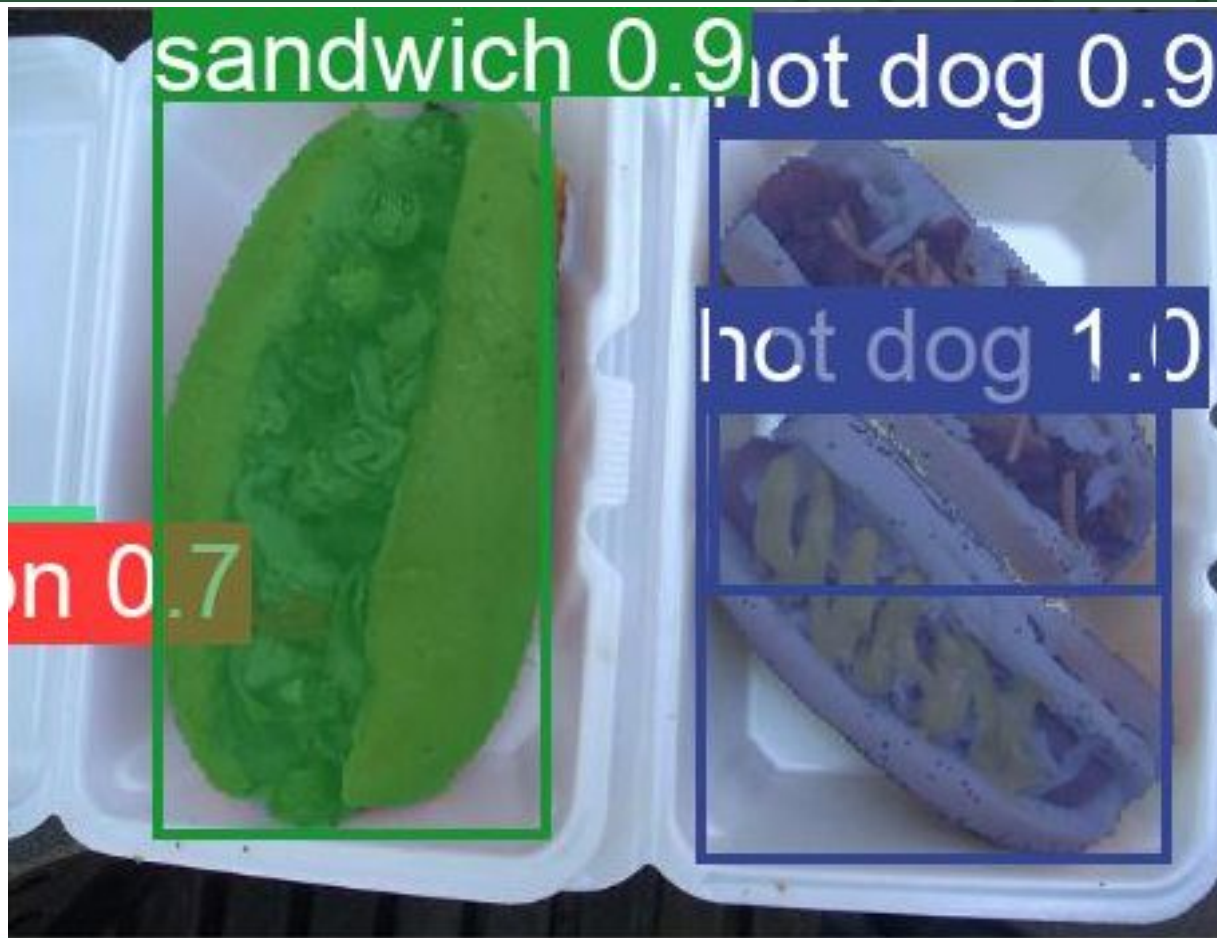
metrics/mAP 0.5(M)
0.8492

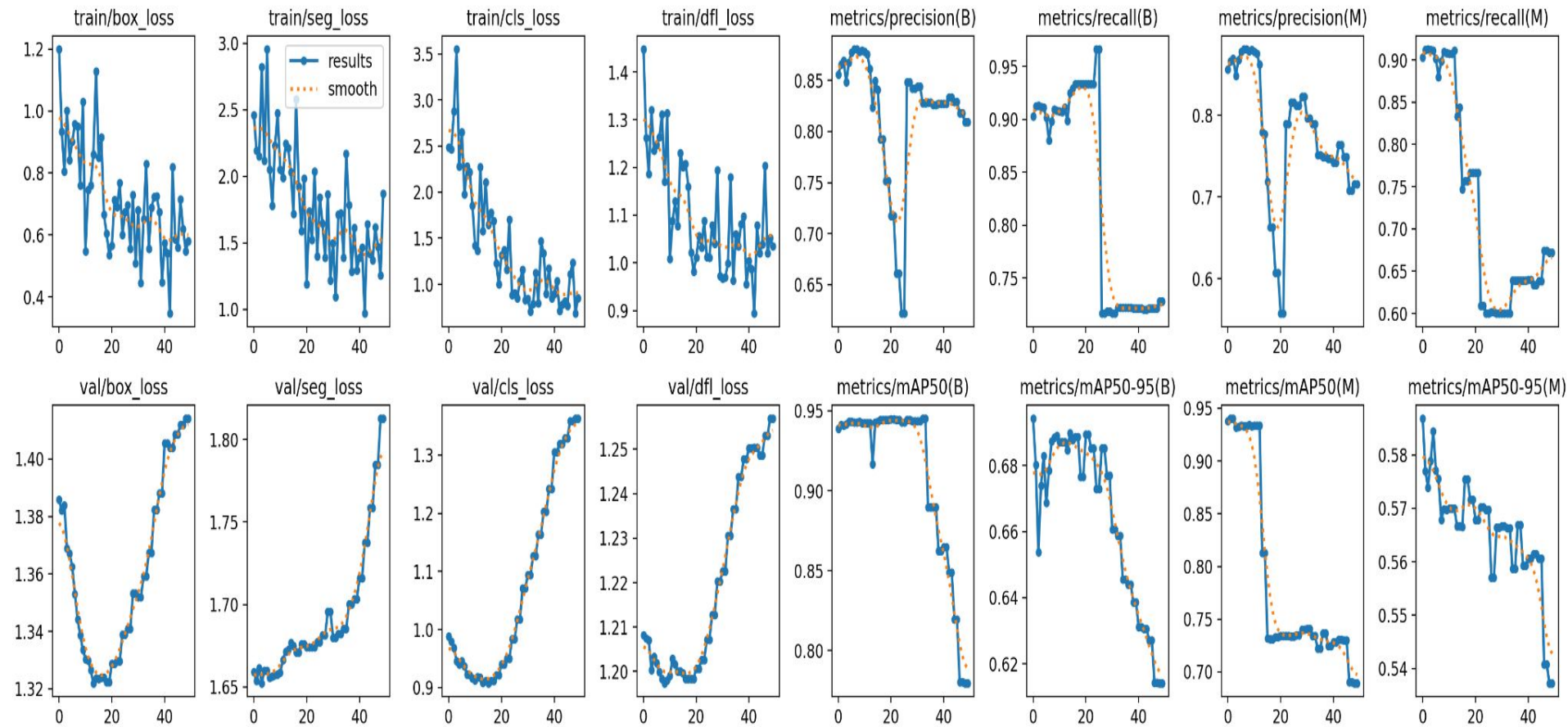


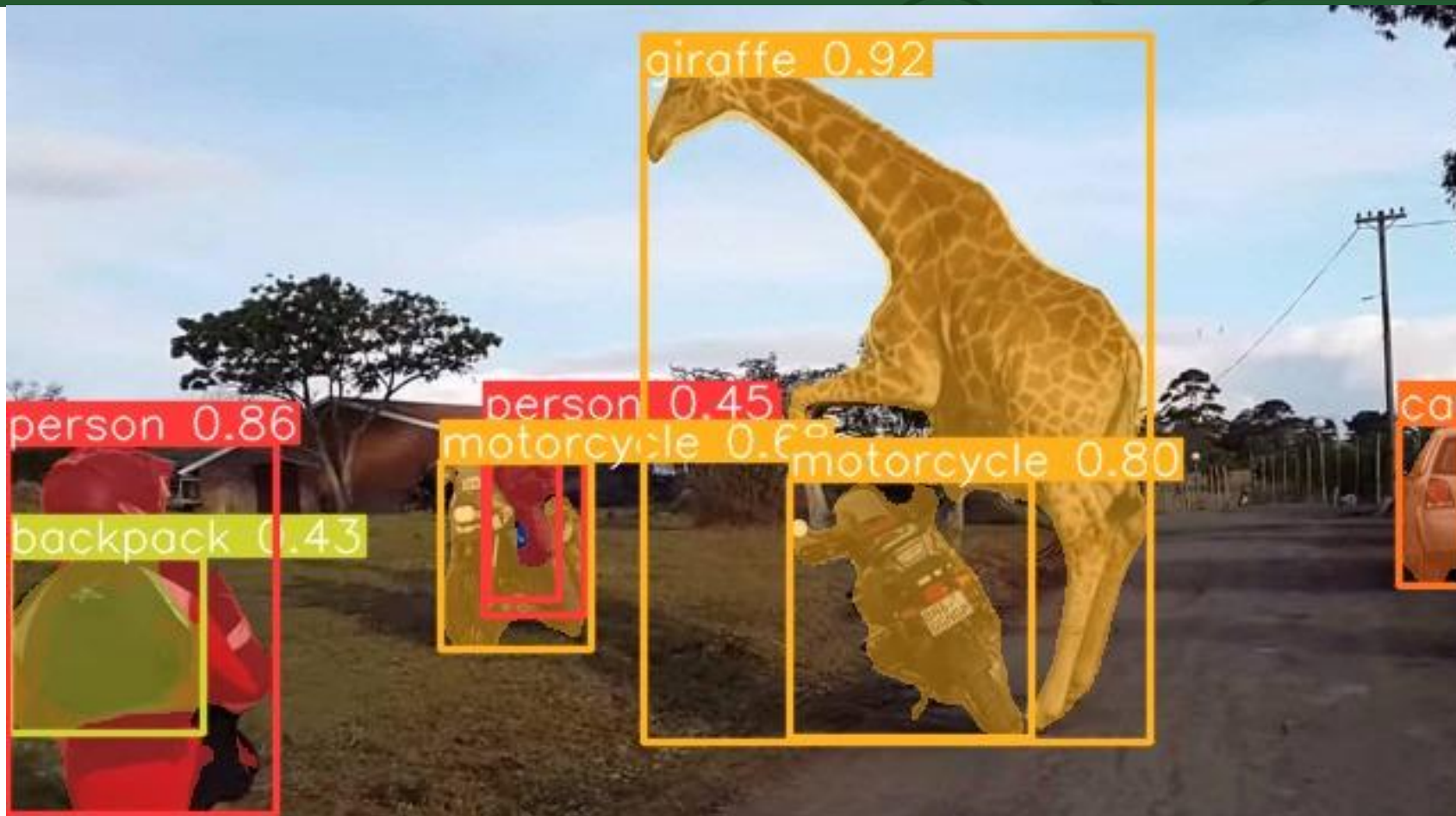
metrics/mAP 0.5:0.95(M)
0.57685

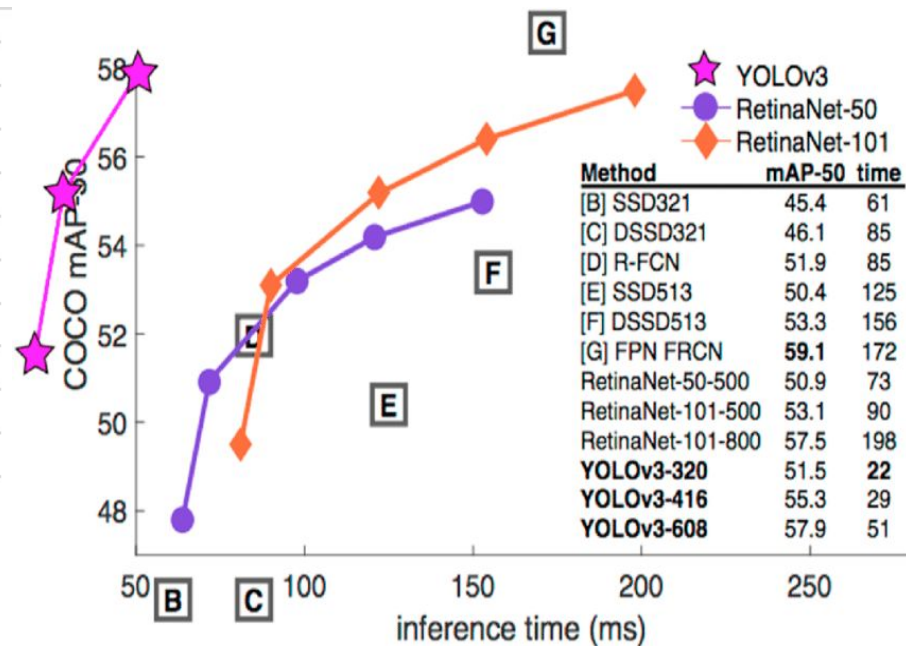
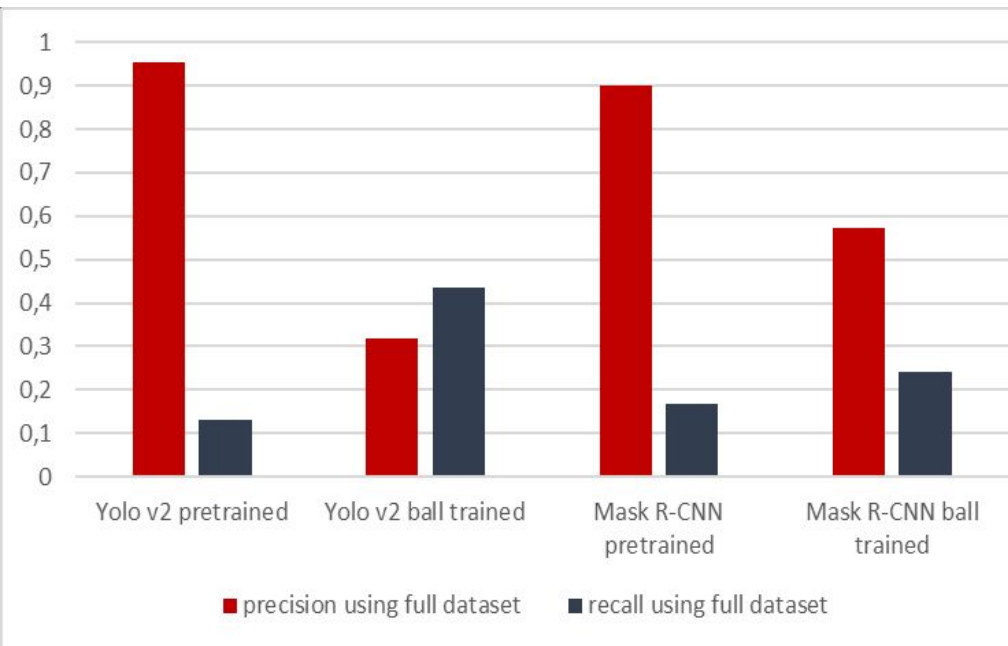


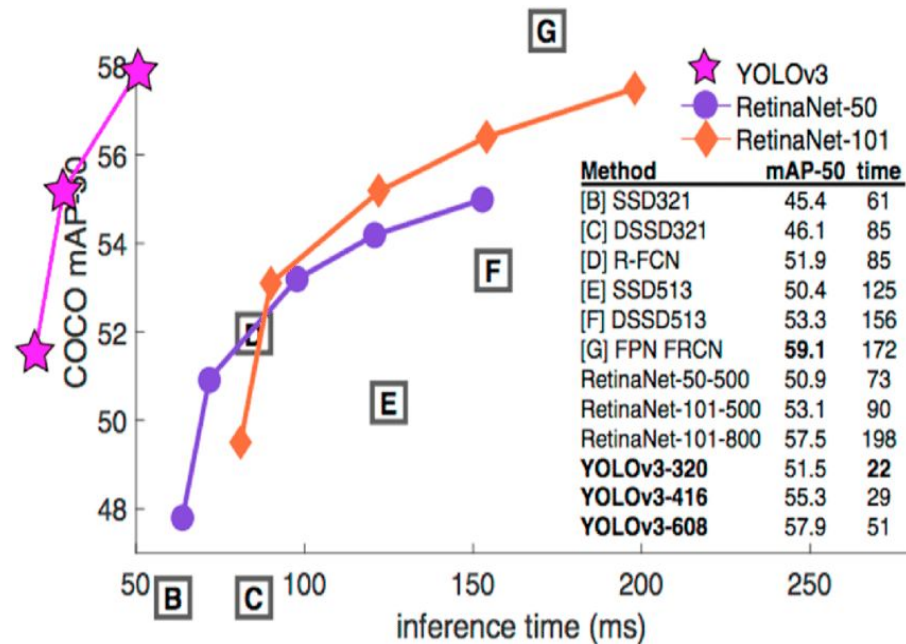
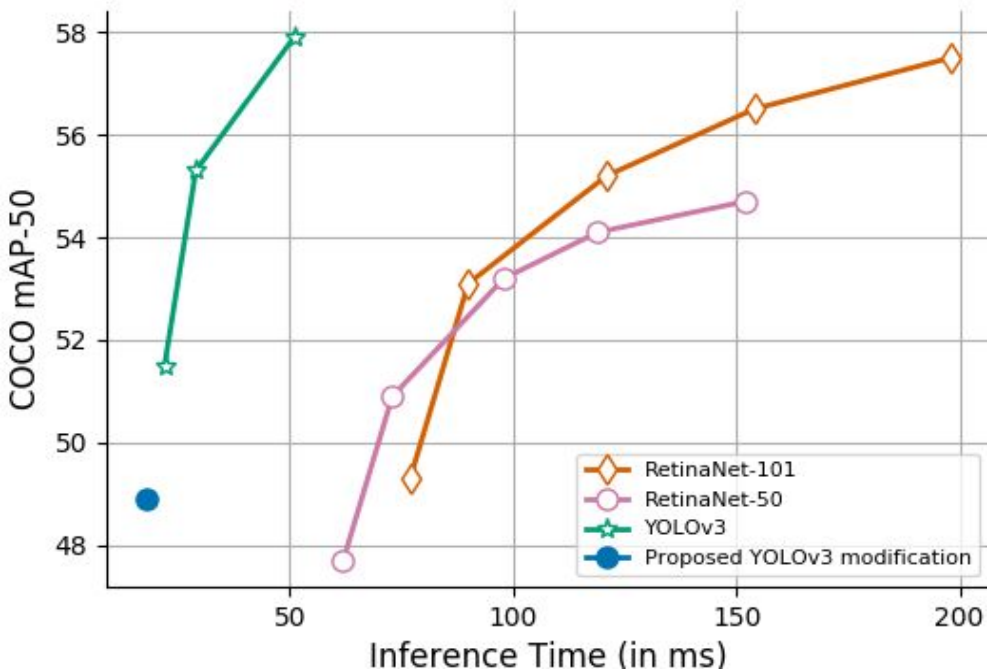
Resultados e Discussão











- Obrigado a todos os presentes e ao Professor Faria

