Fast(er) RCNN

Mehrtash Harandi

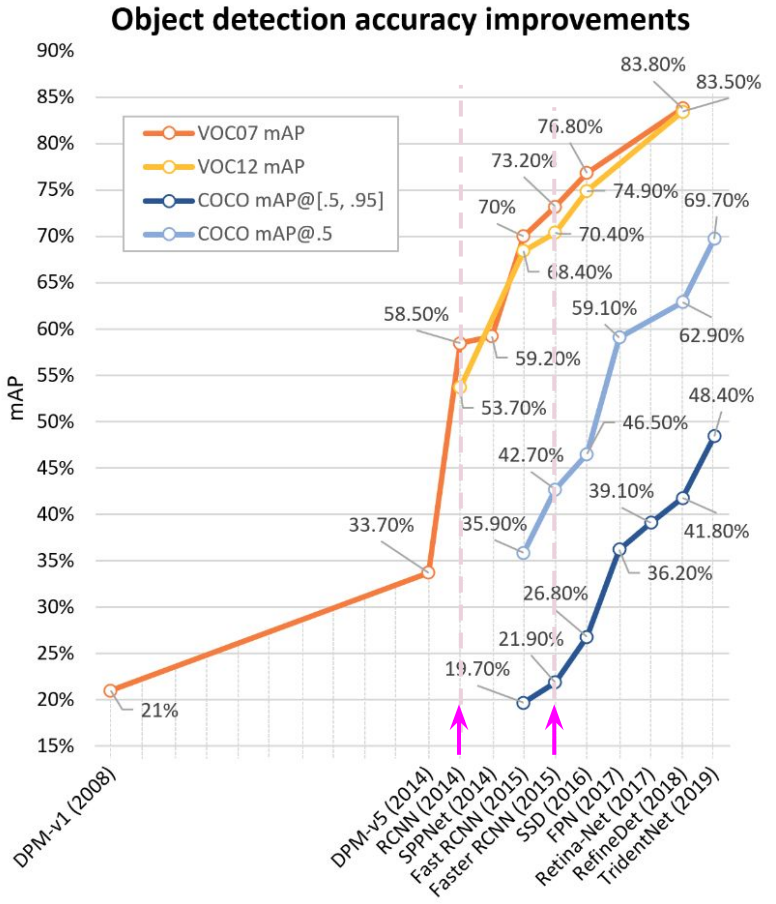
RCNN

Pros.

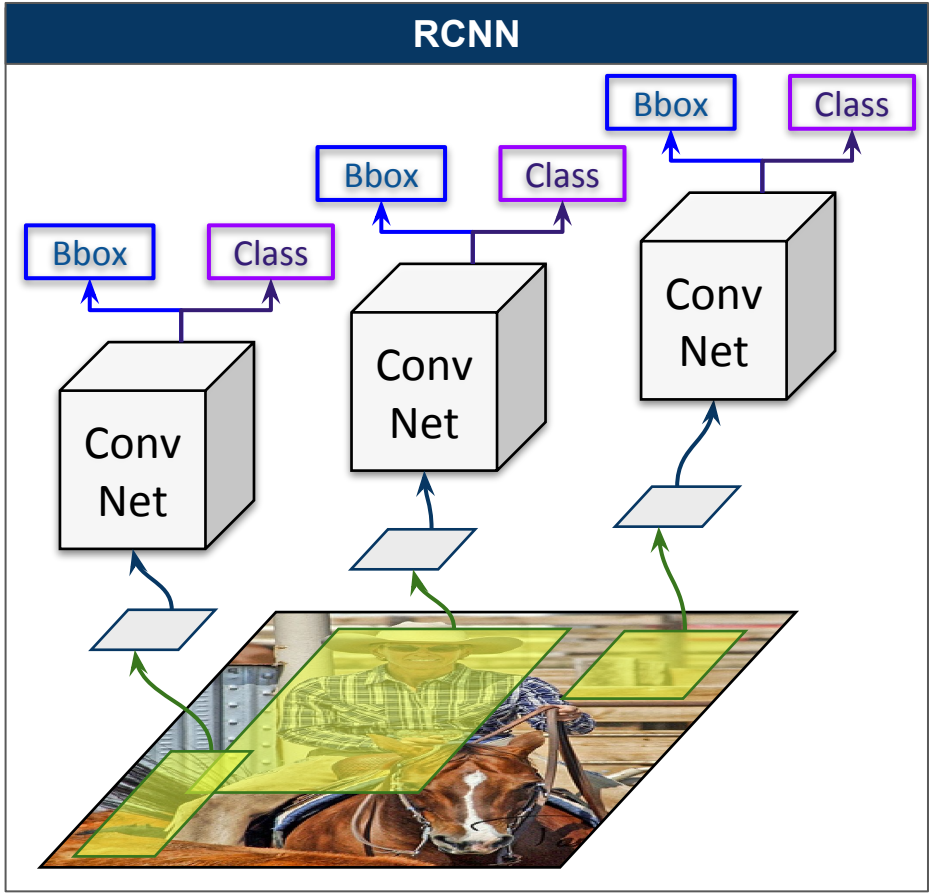
CNNs can be used to produce variable number of outputs
Outperform handcrafted object detectors

Cons.

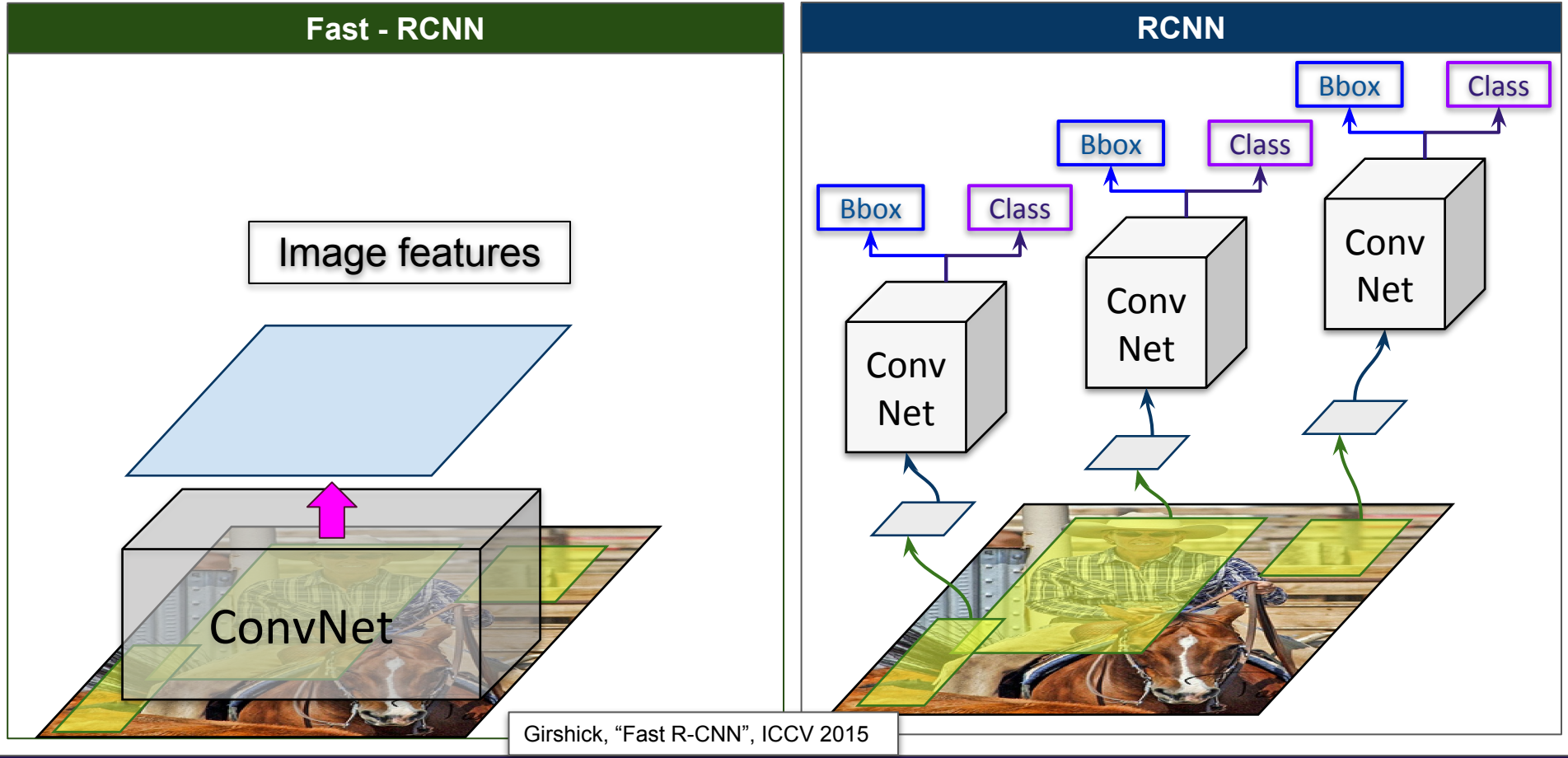
Very slow! Need to do ~2k forward passes for each image!



Fast-RCNN

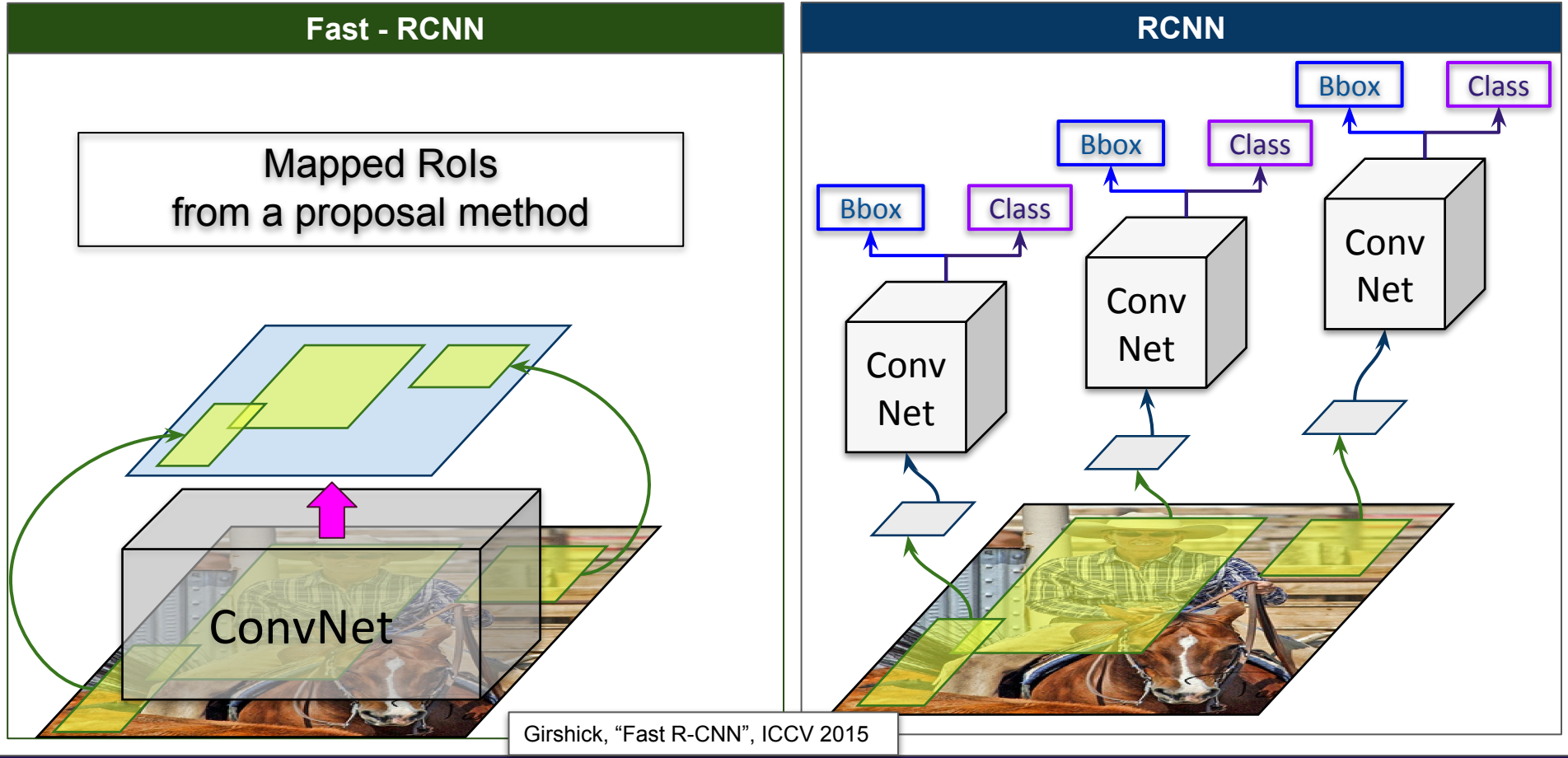

RCNN
Bbox
Class
Bbox
Class
Bbox
Class
Conv Net
Conv Net
Conv Net

Fast-RCNN

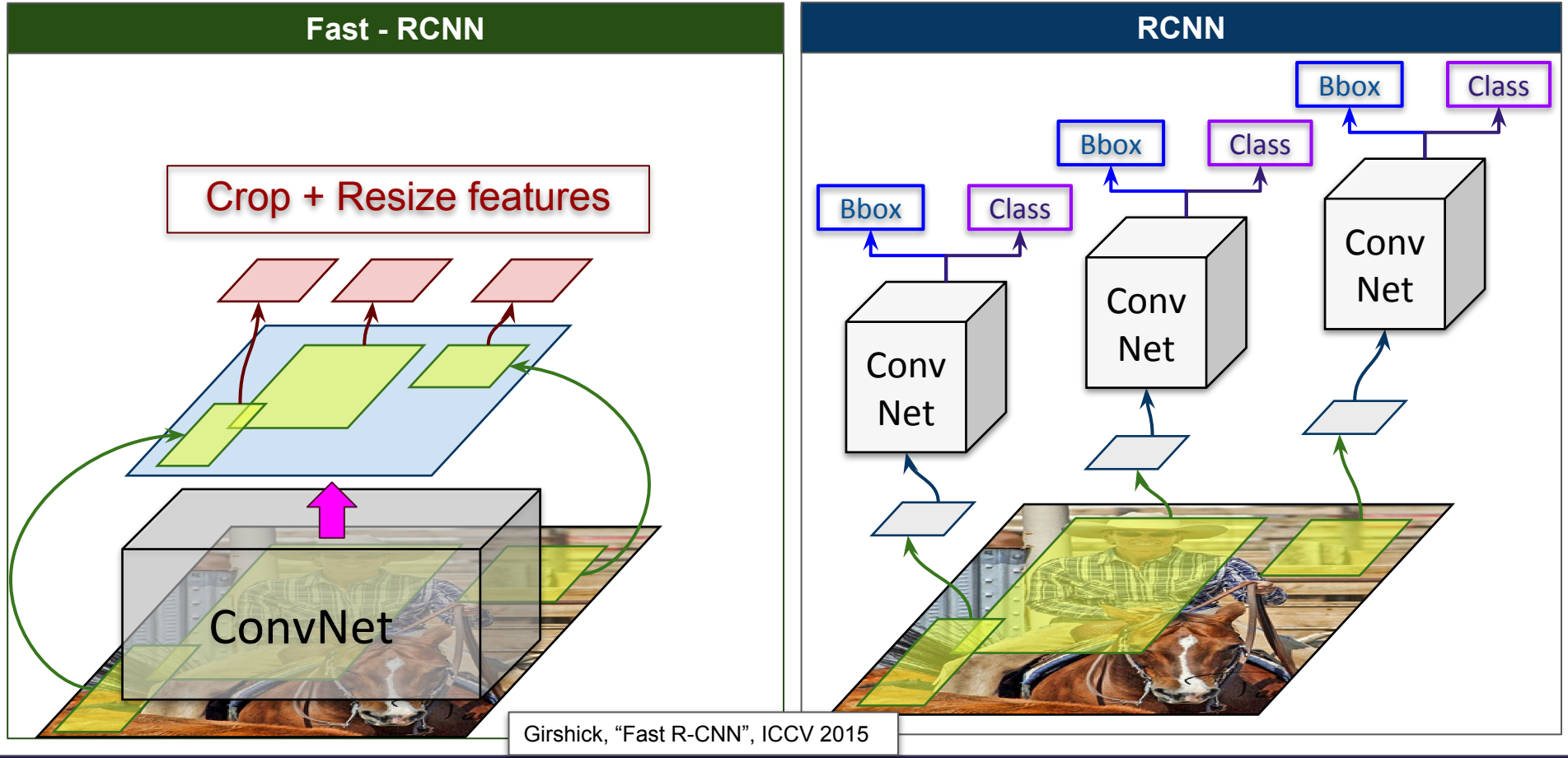


Girshick, “Fast R-CNN”, ICCV 2015

Fast-RCNN

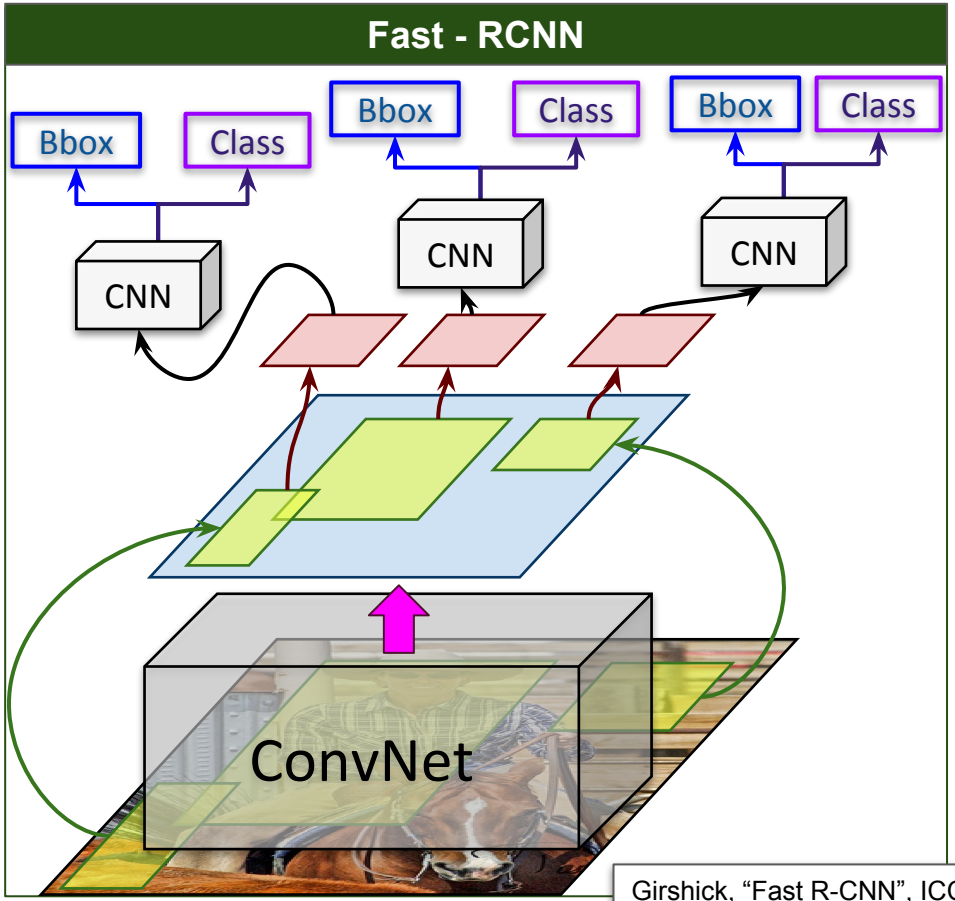

Fast - RCNN
Mapped RoIs
from a proposal method
ConvNet
RCNN
Bbox
Class
Conv
Net
Girshick, “Fast R-CNN”, ICCV 2015

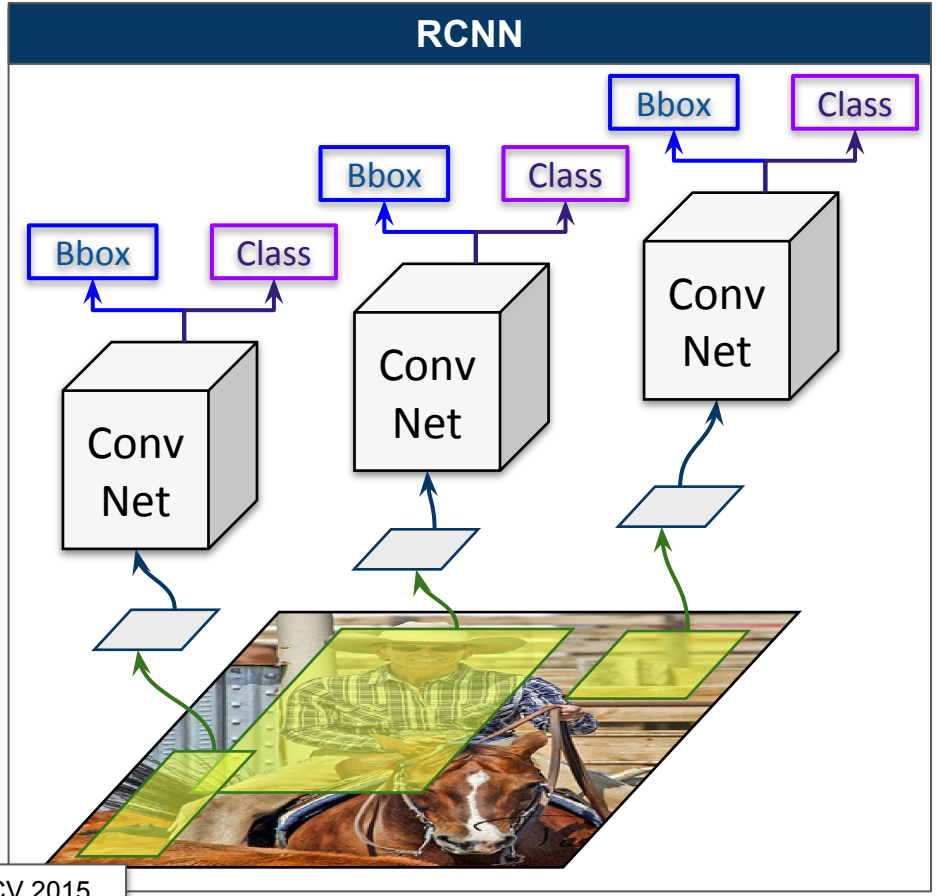
Fast-RCNN



Girshick, “Fast R-CNN”, ICCV 2015

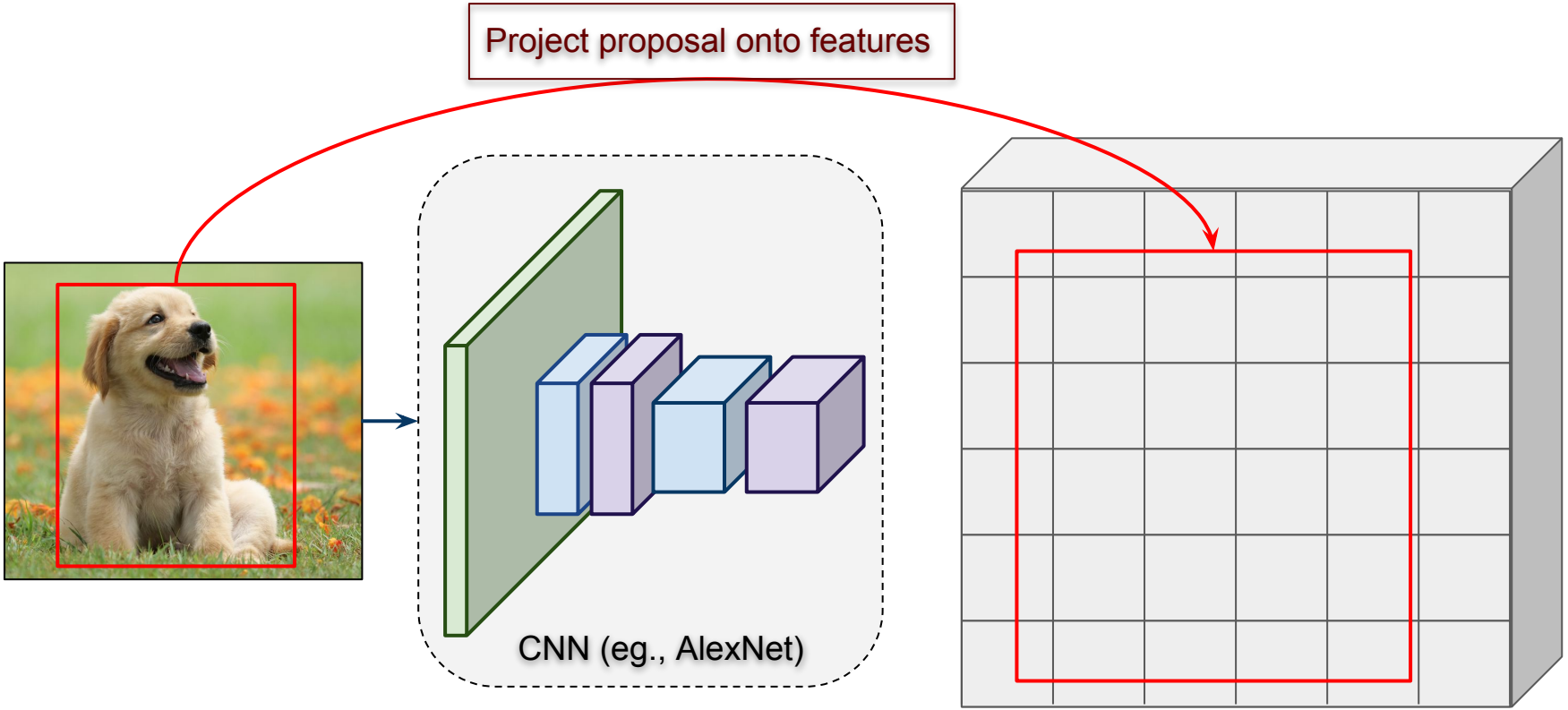
Fast-RCNN



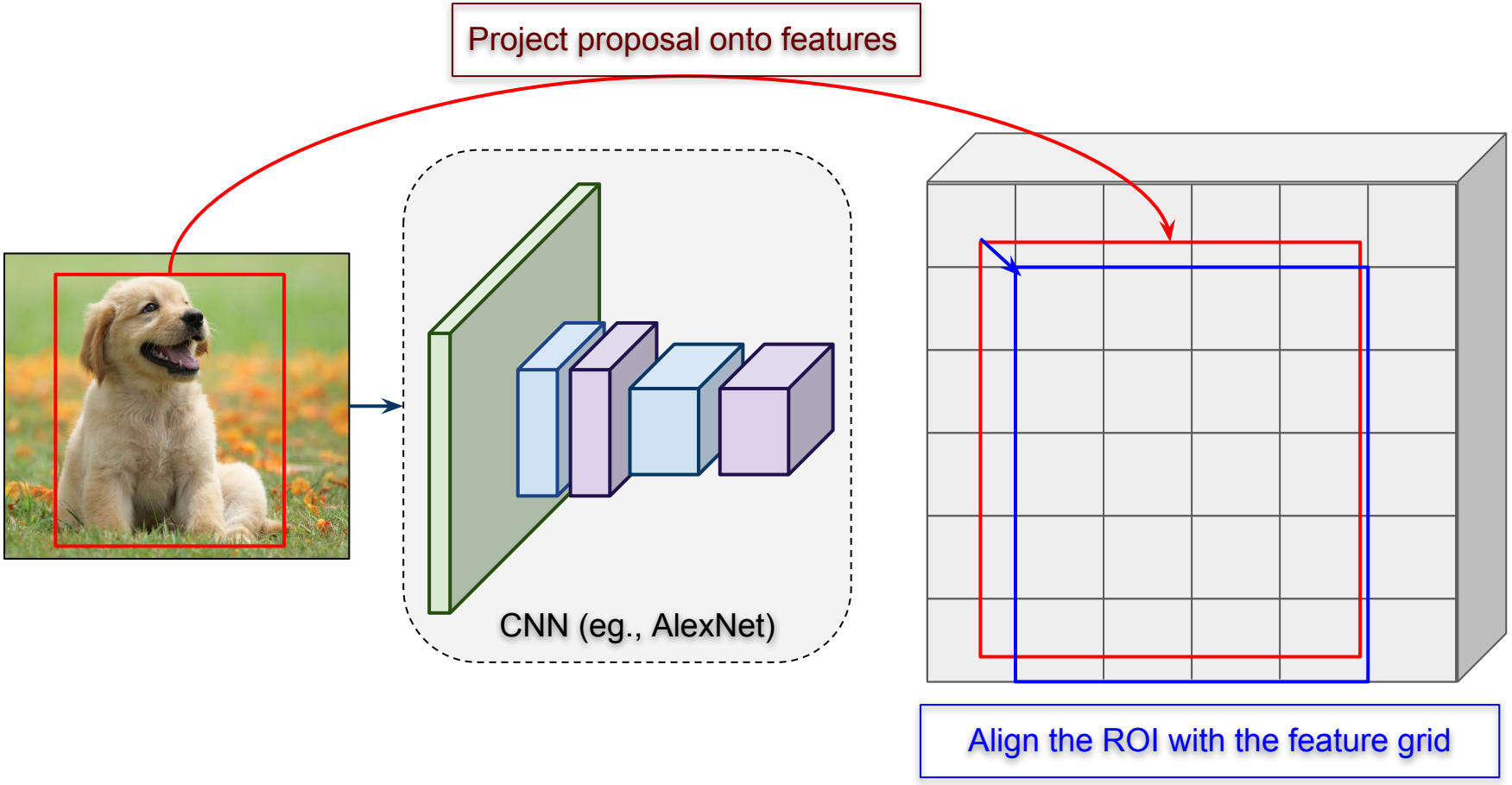


Girshick, “Fast R-CNN”, ICCV 2015

Fast-RCNN

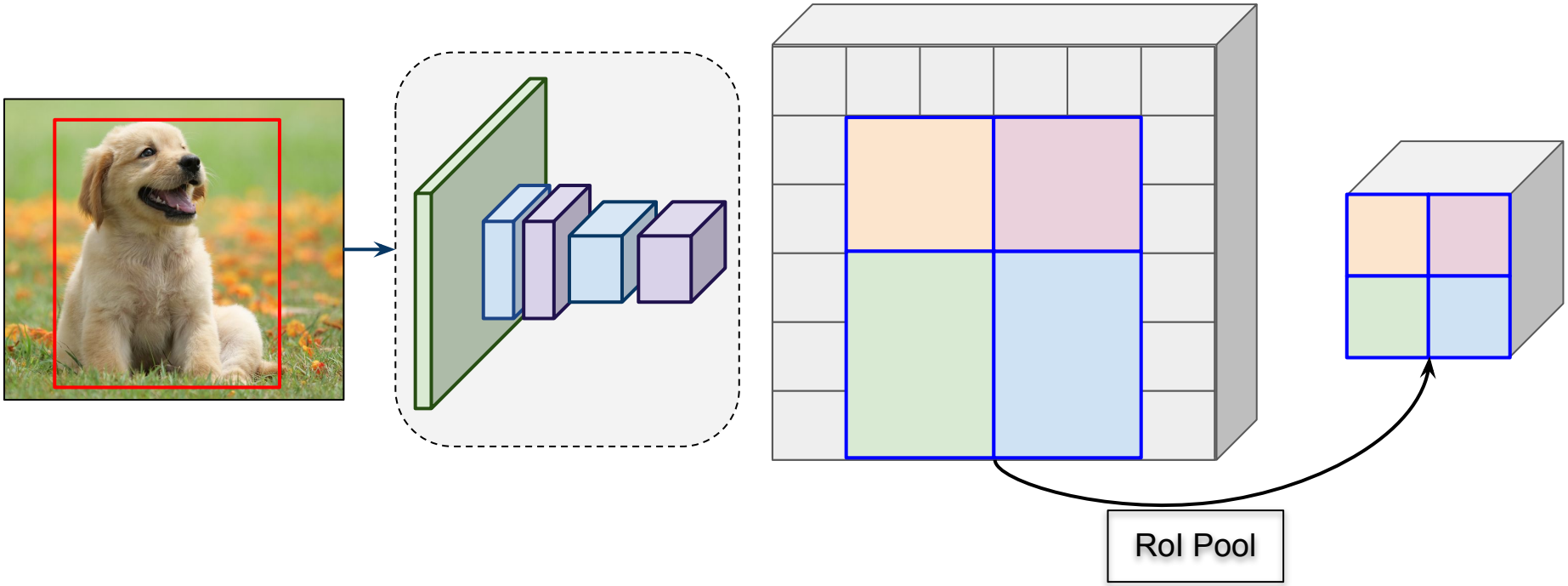


Fast-RCNN


Project proposal onto features
CNN (eg., AlexNet)
Align the ROI with the feature grid

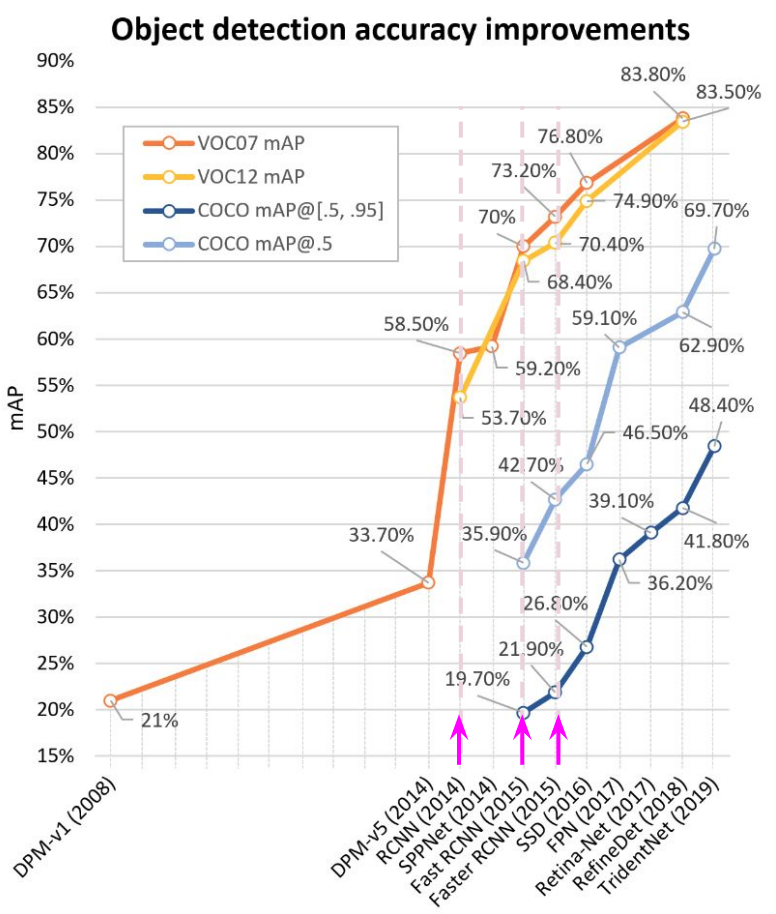
Fast-RCNN

Need fixed-size features for the classification/regression network



Faster RCNN

	R-CNN	Fast R-CNN	Faster R-CNN
Test Time per Image	50 Seconds	2 Seconds	0.2 Seconds
Speed Up	1x	25x	250x

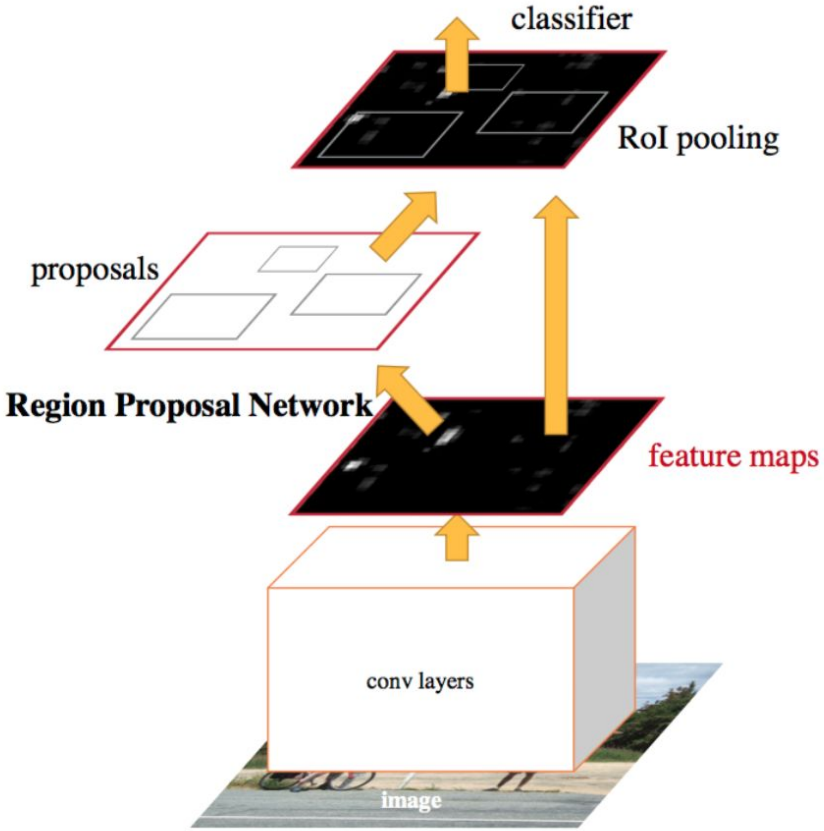


Faster RCNN

Faster RCNN

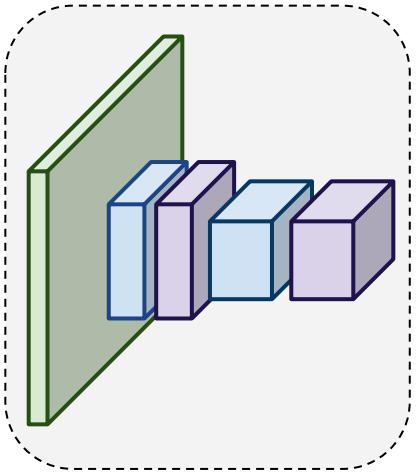
Equipped with Region Proposal Network (**RPN**) to predict proposals from features

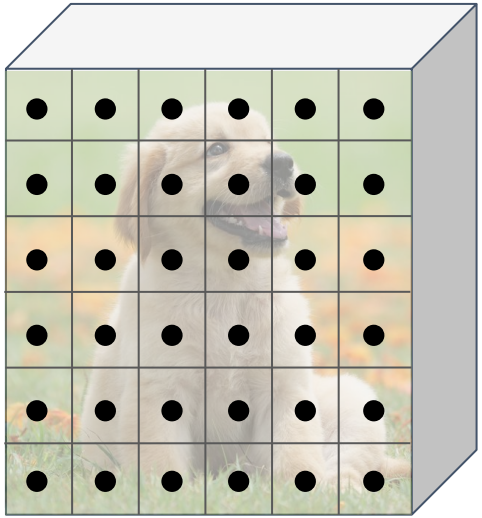
Two-stage detector



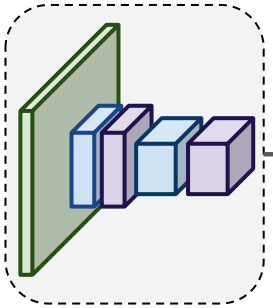
Ren et al, “Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks”, NeurIPS 2015

Faster RCNN - RPN



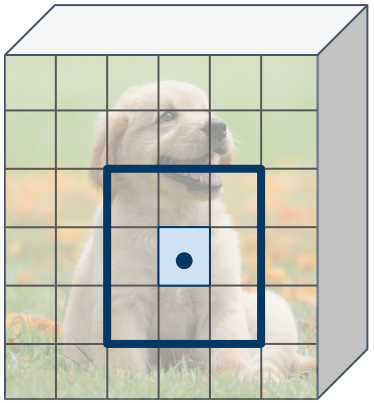


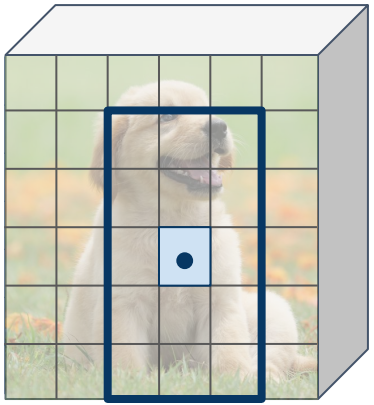
Faster RCNN - RPN

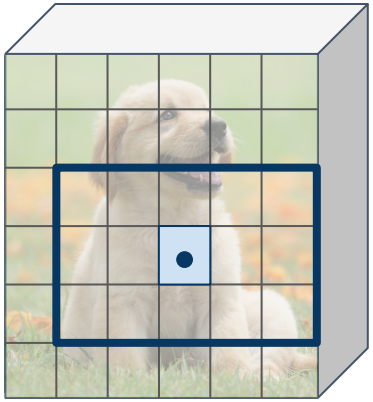


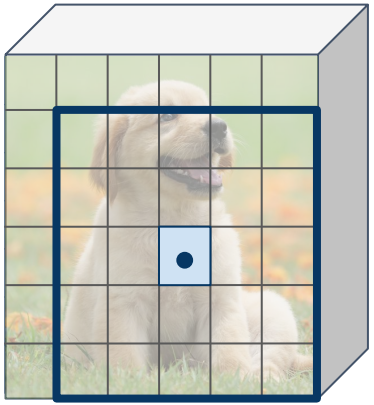
Classification loss

Bounding-box Regression loss









Mask RCNN

Fast(er) RCNN