



# Perception

## Object Detection

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# Problem Definition

$F($  ) = (*Cat*,



)

Bounding Box

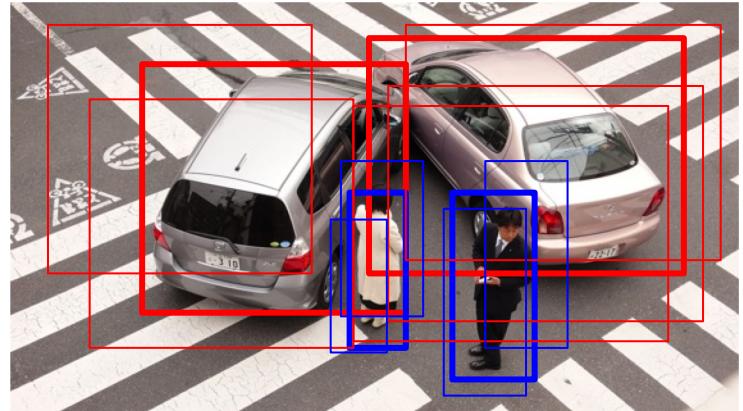
## | Object Detection:

- Identifying the locations and categories of objects in an image.

# General Workflow

## | Two-Stage Method

- Stage-One: Proposal Generation

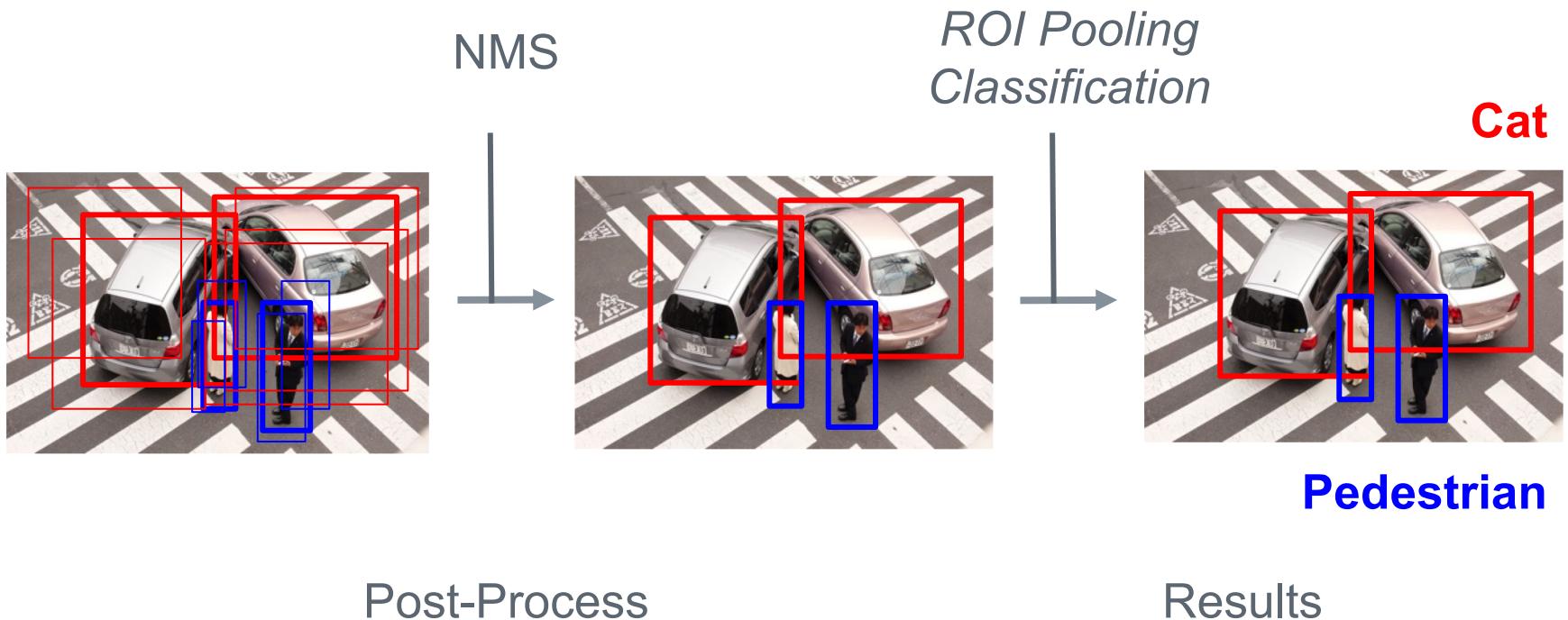


Region Proposals

# General Workflow

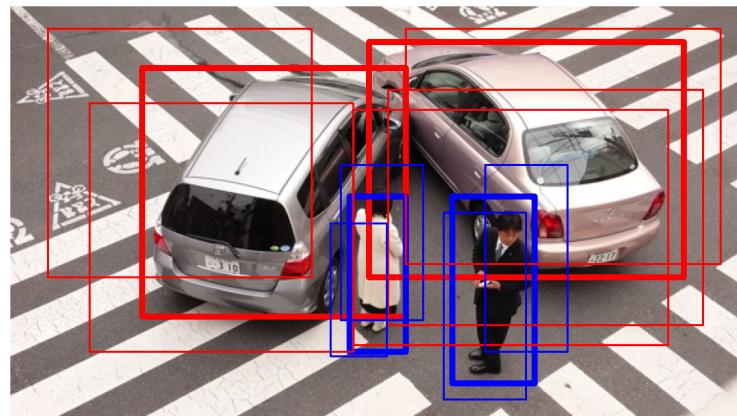
## Two-Stage Method

- Stage-Two: Post-Process and Classification



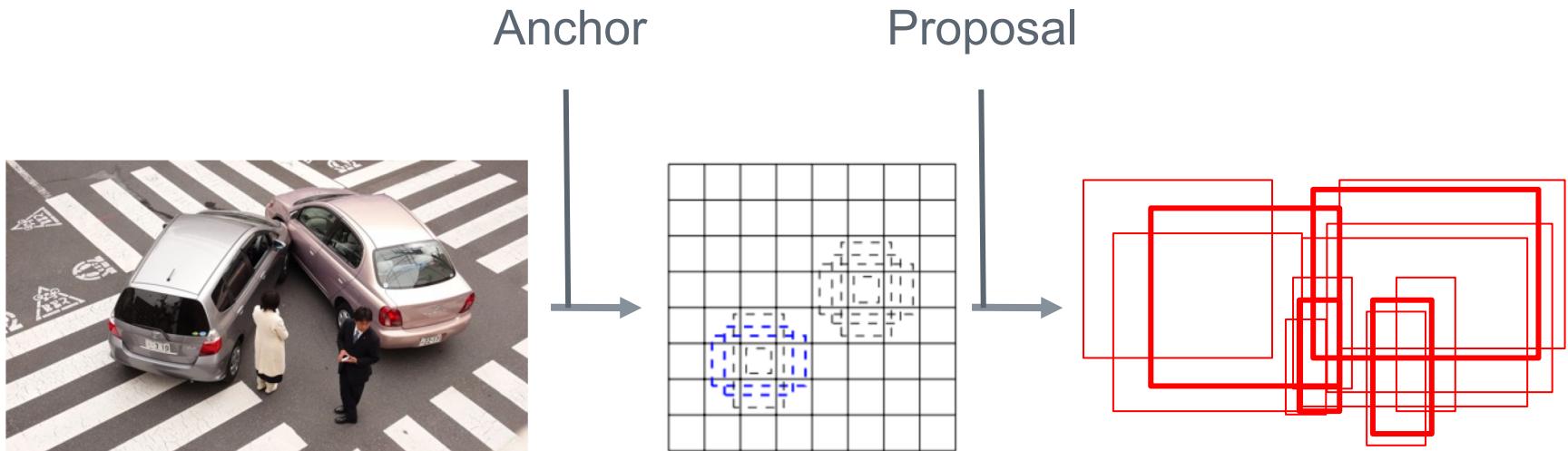
# Relevant Methods

## | Proposal Generation



# Relevant Methods

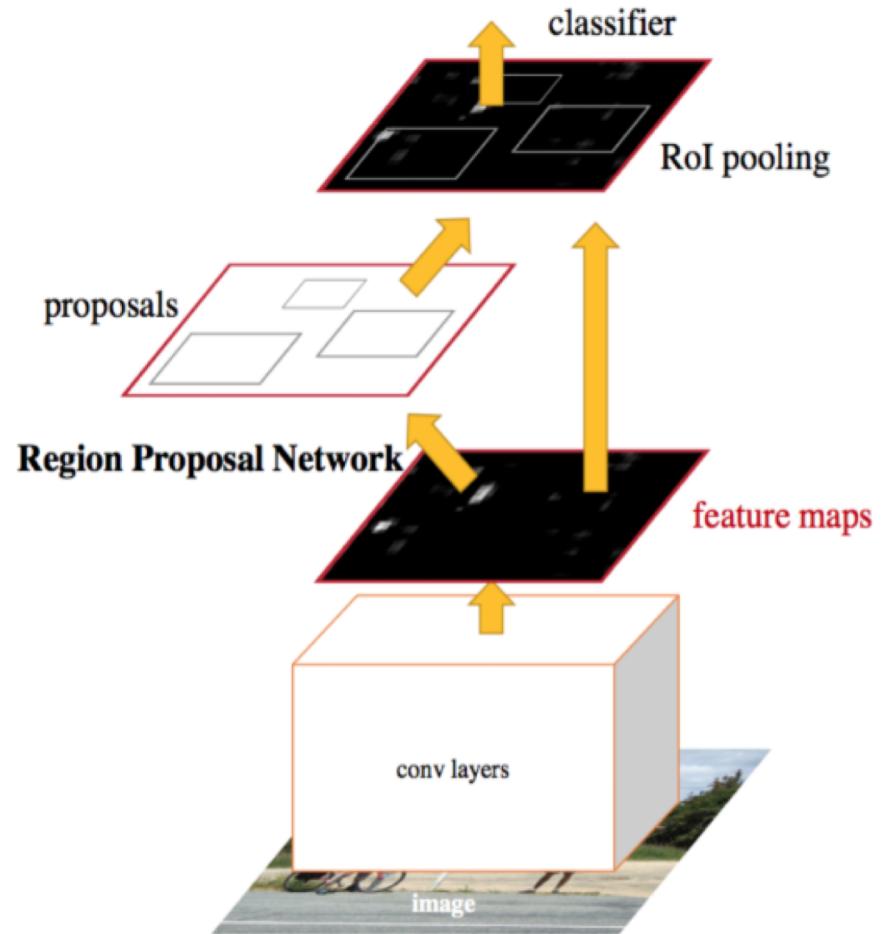
## | Region Proposal Network (RPN)



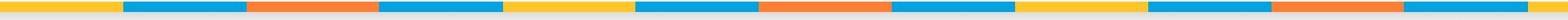
# Relevant Methods

## Region of Interest Pooling (ROI):

- Pool out features from the feature maps based on the generated proposals.



# Reading Materials



## | Related Publications:

- Rich feature hierarchies for accurate object detection and semantic segmentation
- Fast-RCNN
- Faster-RCNN
- You only look once: Unified, real-time object detection (YOLO)

Girshick, Ross, et al. "Rich feature hierarchies for accurate object detection and semantic segmentation." Proceedings of the IEEE conference on computer vision and pattern recognition. 2014.

Girshick, Ross. "Fast r-cnn." Proceedings of the IEEE international conference on computer vision. 2015.

Girshick, Ross. "Fast r-cnn." Proceedings of the IEEE international conference on computer vision. 2015.

Redmon, Joseph, et al. "You only look once: Unified, real-time object detection." Proceedings of the IEEE conference on computer vision and pattern recognition. 2016.