

SIGN BOARD DETECTION

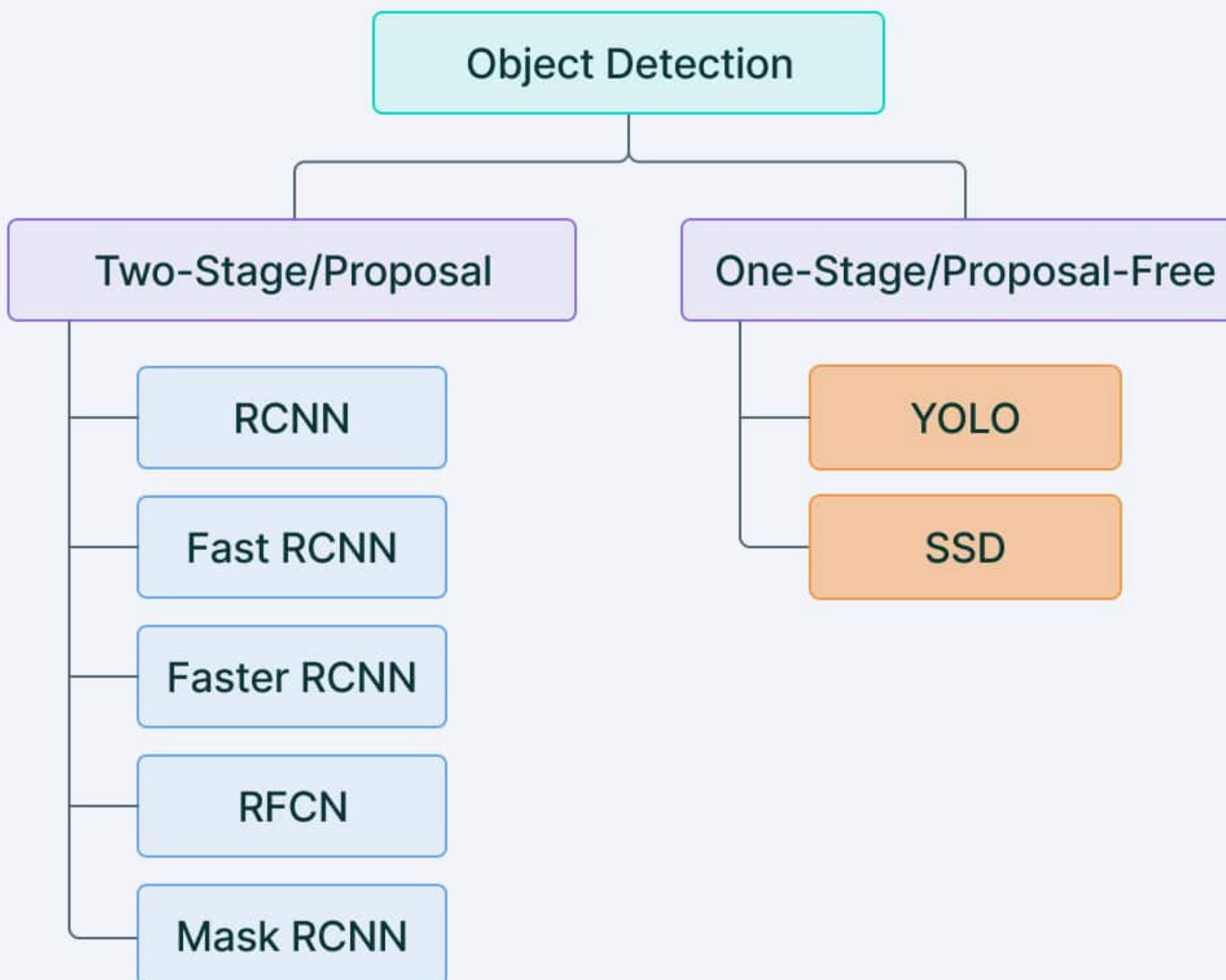
Using Yolo (Python)

OBJECT DETECTION

Object detection is a computer vision task that involves identifying and locating objects in images or videos. It is an important part of many applications, such as surveillance, self-driving cars, or robotics. Object detection algorithms can be divided into two main categories: single-shot detectors and two-stage detectors.

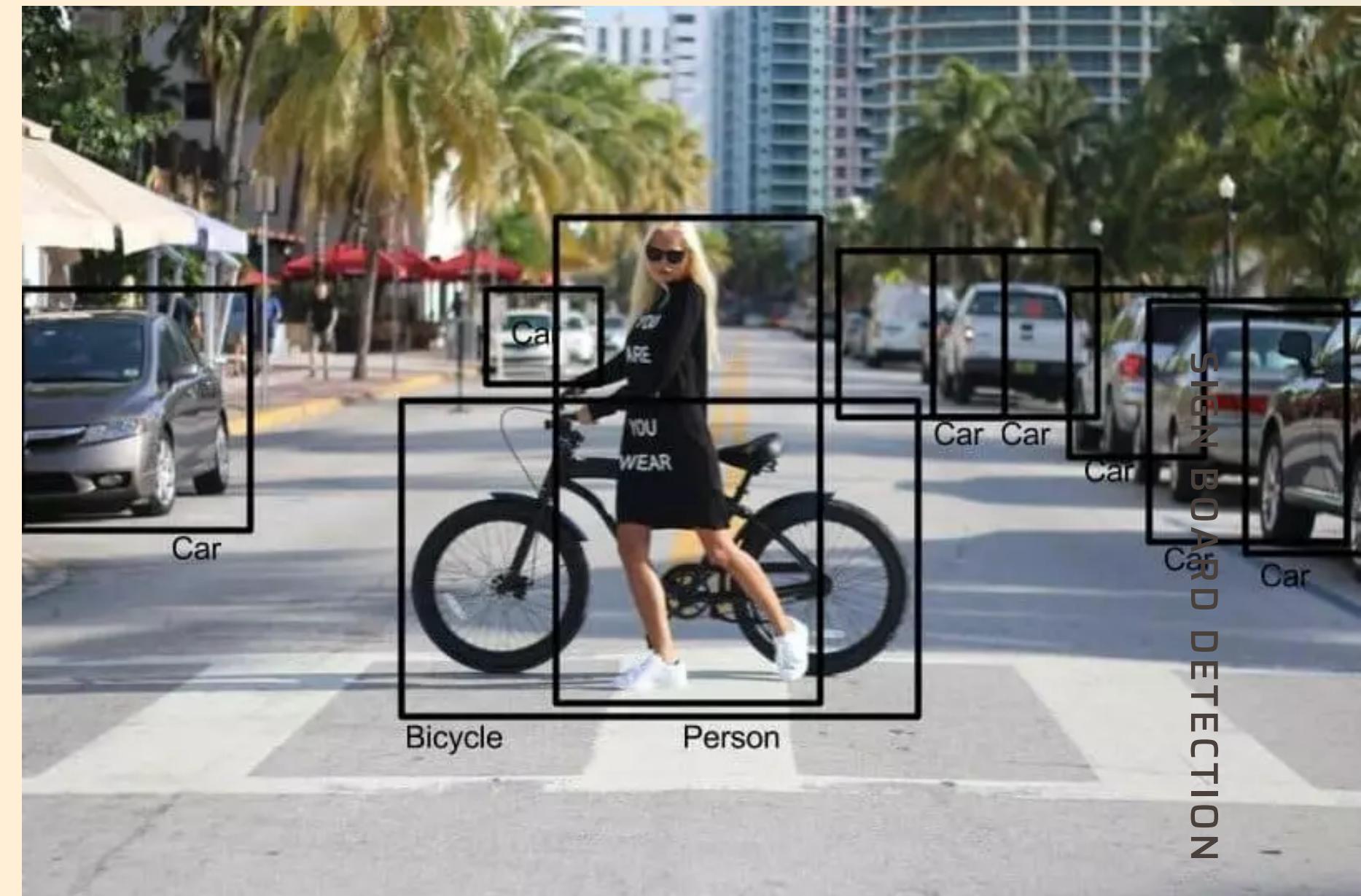
SIGN BOARD DETECTION
USING YOLO

One and two stage detectors



SINGLE SHOT DETECTION

Single-shot object detection uses a single pass of the input image to make predictions about the presence and location of objects in the image. It processes an entire image in a single pass, making them computationally efficient.



TWO-SHOT DETECTION

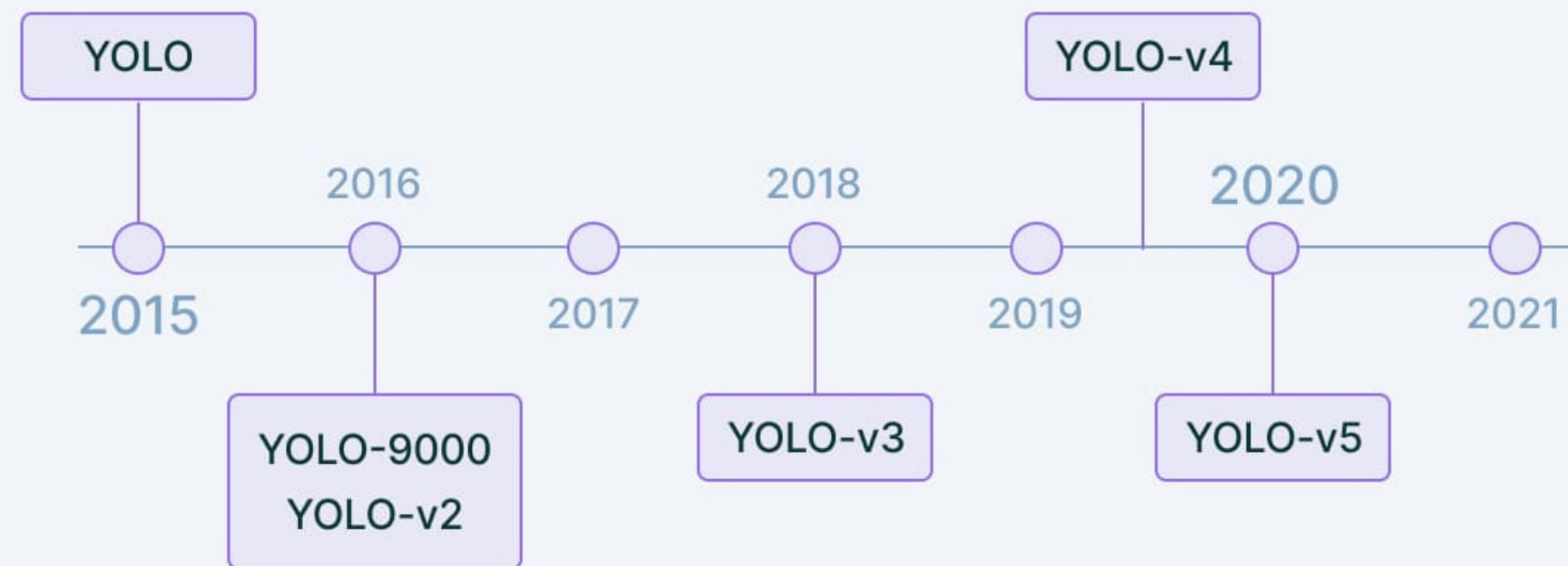
Two-shot object detection uses two passes of the input image to make predictions about the presence and location of objects. The first pass is used to generate a set of proposals or potential object locations, and the second pass is used to refine these proposals and make final predictions. This approach is more accurate than single-shot object detection but is also more computationally expensive.

**WHAT IS
YOLO?**

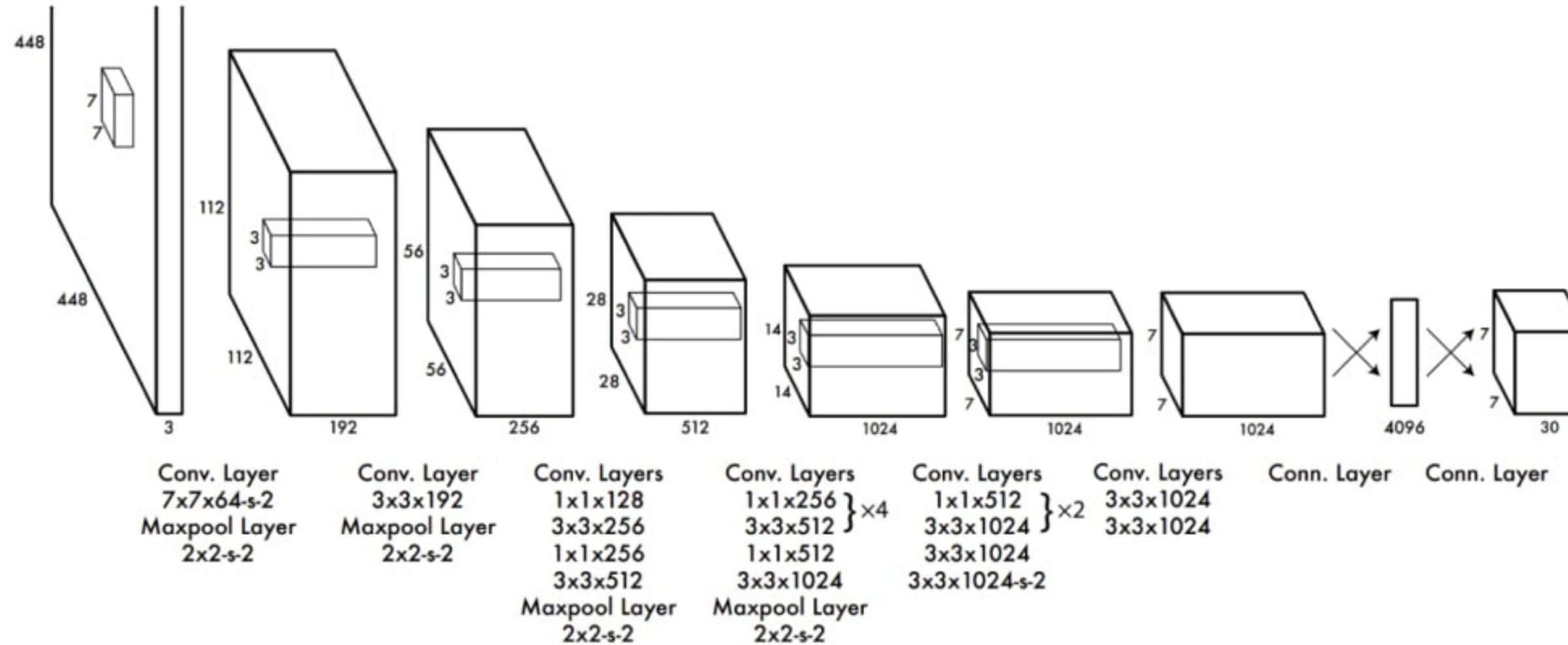
You Only Look Once (YOLO) proposes using an end-to-end neural network that makes predictions of bounding boxes and class probabilities all at once. It differs from the approach taken by previous object detection algorithms, which repurposed classifiers to perform detection.



YOLO timeline



V7 Labs



The Architecture. Our detection network has 24 convolutional layers followed by 2 fully connected layers. Alternating 1×1 convolutional layers reduce the features space from preceding layers. We pretrain the convolutional layers on the ImageNet classification task at half the resolution (224×224 input image) and then double the resolution for detection.

Ultralytics YOLOv8

Ultralytics YOLOv8 is the latest version of the YOLO object detection and image segmentation model developed by Ultralytics. YOLOv8 is a cutting-edge, state-of-the-art (SOTA) model that builds upon the success of previous YOLO versions and introduces new features and improvements to further boost performance and flexibility.

Image Classification

Is this a dog or a person?



Neural
Network
Output

Dog = 1
Person = 0

Object Localization

Where exactly is the dog in
this image?

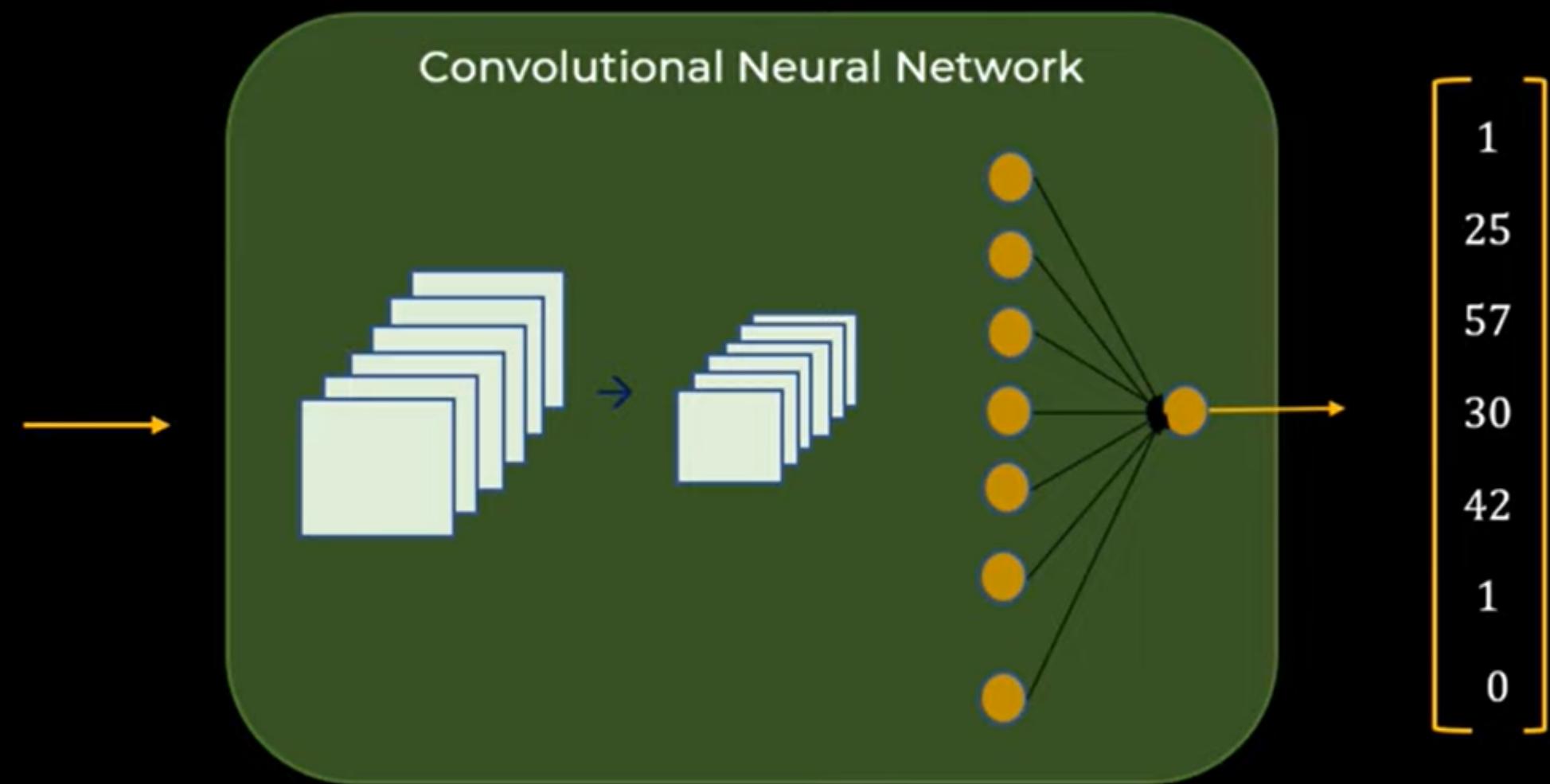


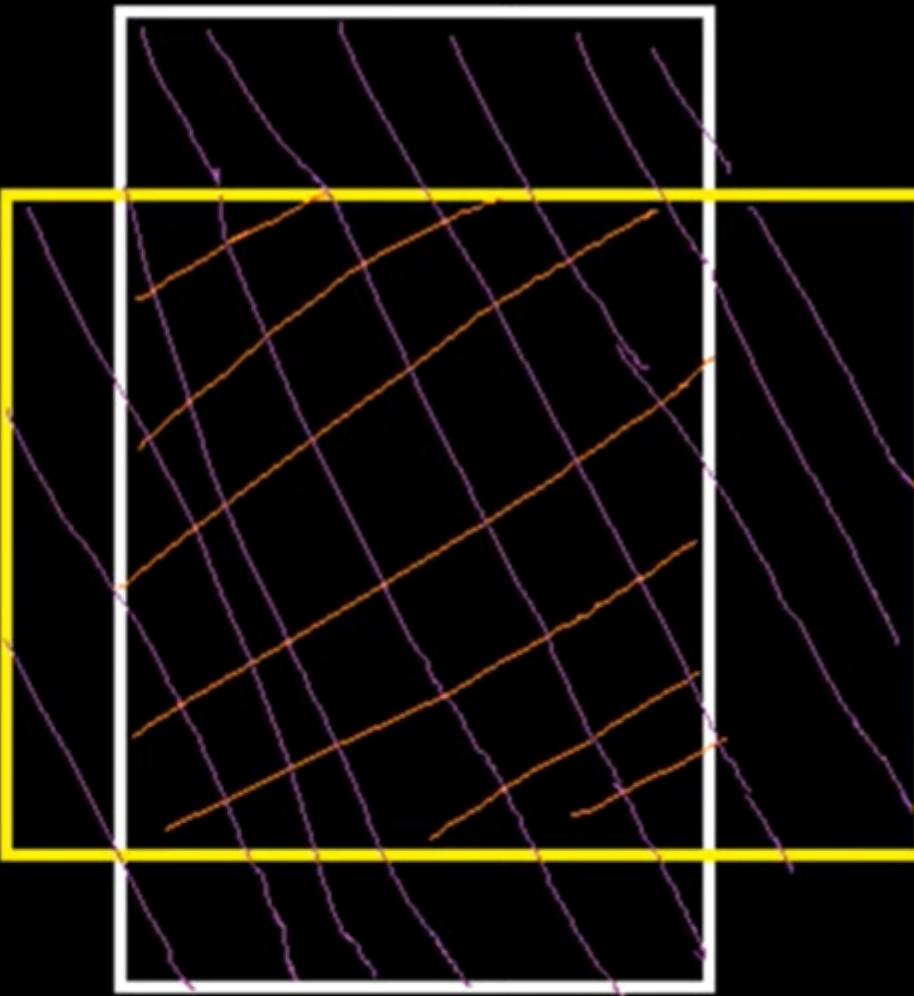
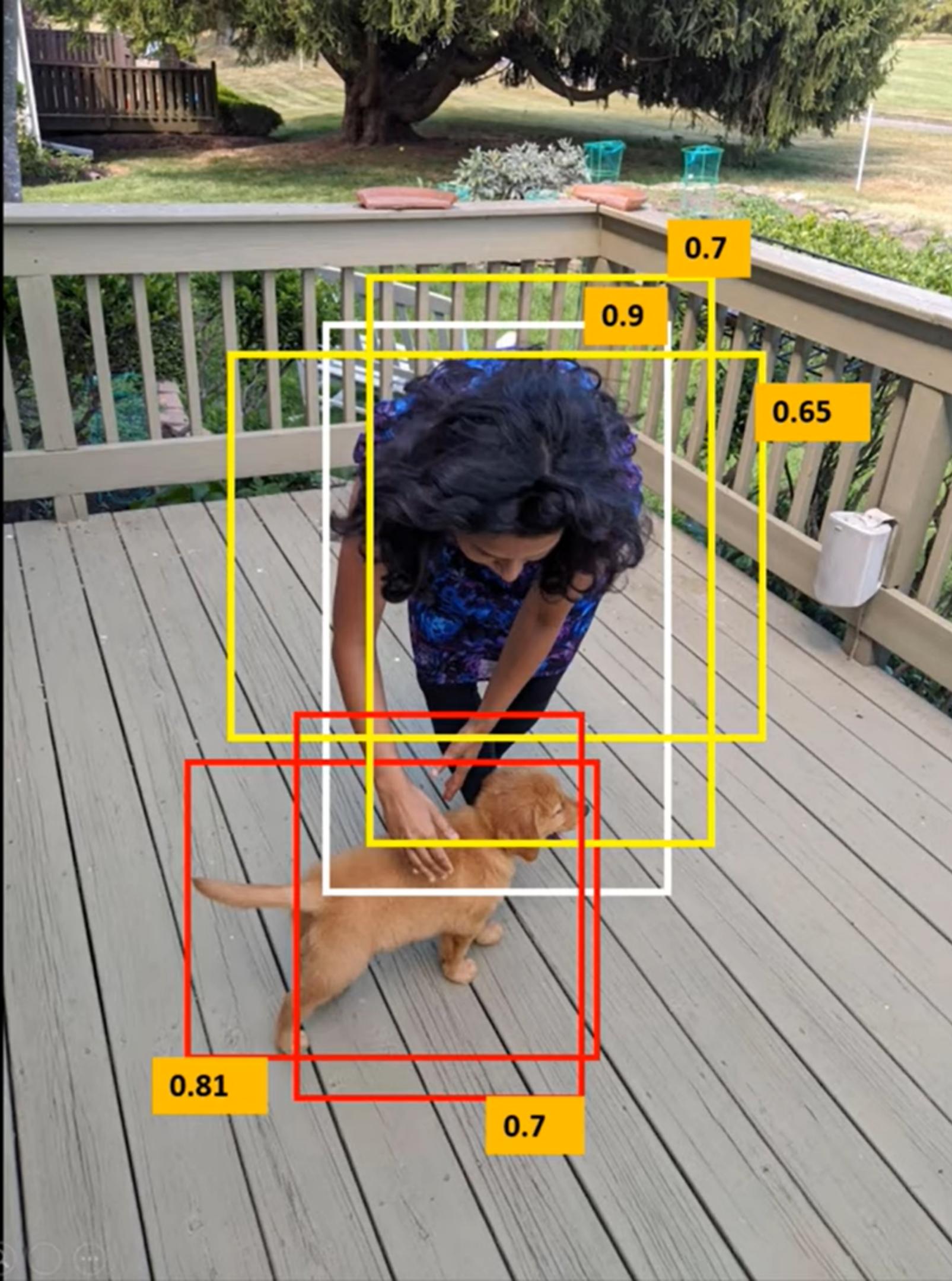
Neural
Network
Output

Dog = 1
Person = 0

+

Bounding
Box





Intersection over union = intersect area / union area

Intersection over union : IOU

CNN with Two anchor boxes

