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Deep Learning

Q - 10 function of tensorflow in object detection.

1. `tf.image.decode_jpeg()`

Purpose: Converts image file into a tensor.

Usage: Used to read image input before detection.

`image = tf.image.decode_jpeg(image_bytes)`

2. `tf.image.resize()`

Purpose: Resizes image to model's required input size.

`image = tf.image.resize(image, (300, 300))`

3. `tf.keras.layers.Conv2D()`

Purpose: Extracts features from images.

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layer = tf.keras.layers.Conv2D(32, (3, 3),
activation = 'relu')

4. tf.keras.layers.MaxPooling2D()

Purpose: Reduces image size while
keeping important features.

pool = tf.keras.layers.MaxPooling2D((2, 2))

5. tf.image.crop_and_resize()

Purpose: Extracts regions of interest
(ROI)

roi = tf.image.crop_and_resize(images,
boxes, box_indices, crop_size)

6. tf.image.non_max_suppression()

Purpose: Removes duplicate bounding
boxes.

selected = tf.image.non_max_suppression(
boxes, scores, max_output_size = S)

7. tf.keras.losses.Huber()

Purpose: Used for bounding box regression loss.

$$\text{loss} = \text{tf.keras.losses.Huber()}$$

8. tf.keras.applications.MobileNetV2()

Purpose: Pretrained backbone for detection models.

$$\text{base_model} = \text{tf.keras.applications.MobileNetV2(weights='imagenet')}$$

9. tf.image.draw_bounding_boxes()

Purpose: Draws bounding boxes on detected objects.

$$\text{output} = \text{tf.image.draw_bounding_boxes(images, boxes)}$$

10. tf.keras.Model()

Purpose: Defines complete object detection model

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