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Pattern Recognition & Computer Vision

1. What makes the problem of object detection and recognition different than image classification?

Object recognition and recognition is a problem relating to detecting the object within a universal space.

2. How does the Faster R-CNN network decide what parts of the image to analyze?

Faster R-CNN uses Region Proposal Network (RPN). It generates rectangular object proposals as an output (Region of Interest Pooling). RPN predicts object bounds and object scores at each position.

3. How do the YOLO style networks decide what parts of the image to analyze?

YOLO (You Only Look Once) is a real-time object detection algorithm. It decides what parts of the image to analyze by inputting the image into a convolutional neural network (CNN)

4. When doing transfer learning, what part of the deep network is modified to adapt to the new problem?

When doing transfer learning, the weights are frozen in the network. But the last layers are usually the ones adapted to the sets of images.

5. What is the purpose of the deep network when doing a matching problem, such as face recognition?

The purpose of the deep network is to create an efficient representation of a face. These embeddings allow the network to use a similarity metric to compare whether the faces are a match or not.

6. What methods are used to do the actual matching of an input to a database of examples?

Similarity metrics and classification models are used to do the actual matching of an input to a database. Some examples are nearest neighbor which uses Euclidean distance or cosine similarity and there is also K-nearest neighbor.