deeplearning.ai

Machine Learning Engineers Test - (1h45)

24m
to test end

☆ Max pooling layer: backpropagation

In order to backpropagate through a max-pool layer, it is required to pass information about the positions of the max values from the forward pass. True/False.

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Pick one of the choices

- (•) True
- ( ) False

Clear selection

☆ Problems occuring with a Deep Learning Model

You've collected a large dataset and split it into a train and held-out test set. After training your deep learning model, you observe that it performs very well on both the train and test sets, and you are ready to deploy it into the real world. Which, if any, of the following problems might still occur? (Check all that apply.)

Pick the correct choices

- [ ] **Because the model parameters are only local minima of the objective function, your model might not fit the training data well, which would result in poor performance on real world data.**
- [ ] **High performance on the training set is indicative of overfitting, so your model might not generalize to real world data.**
- [x] **The distribution of real world data might be different from the distribution of data in your dataset, so your model might not perform well on it.**
- [ ] **None of these problems will occur, because your model gets high performance on a held-out test dataset.**

Clear selection

☆ Gradient interpretation

Consider a neural network trained to classify images of animals (one class per image). The Loss $\mathcal{L}$ is used during training. The dataset consists in (image, labels) pairs denoted (x,y).

What is the meaning of $\frac{\partial \mathcal{L}}{\partial x}$?

Pick one of the choices

- **It quantifies the influence of the choice of the loss function on the image's pixels' values.**
- **It quantifies the influence of the image's pixels on the loss function's value.**
- **It quantifies the influence of the input layer of the model on the loss function's value.**
- **It quantifies the influence of the choice of the loss function on the first layer's activation.**

Clear selection

☆ End-to-end approach

You want to count the number of fish in the aquarium based on images from a camera facing the aquarium. Assume there's nothing else than fishes and that we can neglect occlusion between fishes.

You are considering using one of the two following approaches:

- **(A)** Input an image (x) to a neural network and have it directly learn a mapping to make a prediction for the number of fishes in the aquarium.
- **(B)** A two-step approach, where you would first (i) detect the fishes in the image (if any), then (ii) sum the predicted bounding boxes to get the number of fishes in the aquarium.

Between these two, Approach B is more of an end-to-end approach because it has distinct steps for the input end and the output end. True/False?

Pick one of the choices

- **True**
- **False**

Clear selection

☆ Loss functions: malicious attack

You have access to a deep neural network trained to classify animals. You are malicious and would like to find an image that is a cat, but that the model will classify as an iguana. This is an optimization problem. Which of these loss functions is a valid quantity to minimize in order to find the malicious image.

A) $L = || x - x_{cat} ||_2^2 + || \hat{y} - y_{iguana} ||_2^2$
B) $L = || x - x_{iguana} ||_2^2 + || \hat{y} - y_{cat} ||_2^2$
C) $L = || x - x_{cat} ||_2^2 - || \hat{y} - y_{iguana} ||_2^2$
D) $L = || x - x_{iguana} ||_2^2 - || \hat{y} - y_{cat} ||_2^2$

where:
x denotes the input
x_{cat} denotes a cat image
x_{iguana} denotes an iguana image
y_{cat} denotes the one-hot vector for the cat label
y_{iguana} denotes the one-hot vector for the iguana label
$\hat{y}$ denotes the network's output prediction

Pick one of the choices

- ○ A
- ○ B
- ◉ C
- ○ D

Clear selection

☆ What layer to use?