You'll often encounter the Deep Learning Algorithms interview during an onsite round for a Deep Learning Engineer (DLE), Deep Learning Researcher (DLR) or Software Engineer - Deep Learning (SE-DL) position.

What to expect in the interview

The interviewer will try to uncover how deeply you understand deep learning algorithms.

Here's a list of questions you might be asked:

- Explain how backpropagation works in a fully-connected neural network.
- Compute the number of parameters in a fully-connected, convolutional, or recurrent neural network.
- What is the difference between Gradient Descent, mini-batch Gradient Descent, and Stochastic Gradient Descent?
- Explain how a layer works among the following list: dense (i.e. fully-connected), convolutional, LSTM, pooling, etc. Does the layer have hyperparameters? If yes, what roles do they play?
- What methods are used to lower the variance? Explain the relevant methods, e.g. Dropout, L1/L2 regularization, Early Stopping, etc.

Resources

Useful content to prepare for this interview:

- deeplearning.ai:
  - Deep Learning Specialization (Coursera)
  - AI Notes: Initializing your neural network (blog post)
  - AI Notes: Parameter optimization in neural networks (blog post)
- Stanford Deep Learning class (CS230):
  - Deep Learning intuition (video)
  - Attacking neural networks with adversarial examples and generative adversarial networks (video)
  - Interpretability of a neural network (video)
  - Deep reinforcement learning (video)
  - Evaluation metrics (blog post)
  - Hyperparameter tuning (blog post)
  - Understanding gradient descent and backpropagation (blog post)

Recommended Plan

Here are useful rules of thumb to follow:

- Listen to the hints given by your interviewer.
  Example: You're computing the number of parameters of a convolution layer and state that "the number of weights is filter width filter height number of filters." If your interviewer questions you with "are you sure?" or "can you recall the shape of the input volume?", there is a high chance your answer is imprecise or wrong. You should react by reconsidering and talking through your answer. In this scenario, the interviewer expects you to remember that, in a CNN, filters have the depth of the input volume. Thus, the right count is filter width filter height input depthnumber of filters. If the interviewer asks you "is that all?," it's probably not. Usually parameters refer to weights+biases, so the interviewer expects you to count the number of biases as well.
- What type of data is the company dealing with?
  Example: If it's video, you should refresh your knowledge on CNNs and RNNs.
- Is the team building a domain-specific product that requires a certain type of algorithm?
  Example 1: If the team is working on a face verification product, take a look at the Face Recognition lessons of the Coursera Deep Learning Specialization (Course 4), as well as the DeepFace (Taigman et al.) and FaceNet (Schroff et al.) papers prior to the onsite.
  Example 2: If the team is building a robotic arm that will detect and grasp objects, you might want to look at popular object detection, object segmentation, and reinforcement learning algorithms.
- When you are not sure of your answer, be honest and say so. Good interviewers care about your ability rather than your knowledge.
- When you get stuck, think out loud rather than staying silent. Talking through your thought process will help the interviewer correct you and point you in the right direction.