

Certification Details



DEEP
LEARNING
INSTITUTE

Fundamentals of Deep Learning

The format for demonstrating knowledge in the Instructor Certification interview will be a question and answer session with the expectation that you can demonstrate the ability to field student questions and understand the concepts at a deeper level than those attending a workshop.

The following is not a comprehensive list of topics. You may be asked questions on topics not included below to show your mastery of the subject matter.

To become certified to instruct DLI's **Fundamentals of Deep Learning** workshop, you must be prepared to explain the following concepts / terminology:

RMSE / MSE	Features	Reinforcement Learning
Softmax classifiers	Activation functions	LLMs
Cross-entropy	Frameworks	Padding
Natural Language Processing	Dropout	Hyperparameters
Transformers and attention	Adam / Adagrad / RMSProp	Parameters
GenAI - VAEs, GANs, diffusion, etc.	SGD / GD	Transfer Learning
Pooling	CNNs	Image Classification
Overfitting	Training, validation, and test datasets	Forwards and backwards propagation



The following resources may assist you in preparing for your interview:

Optimizers	
Title	Link
An Overview of Gradient Descent Optimization Algorithms	An overview of gradient descent optimization algorithms
SGD optimizer (Josh Starmer)	Stochastic Gradient Descent, Clearly Explained!!! <i>Note: A little campy</i>
Gradient Descent with Momentum (Andrew Ng)	Gradient Descent With Momentum (C2W2L06) <i>Note: A little extra information</i>
RMSProp optimizer (Andrew Ng)	RMSProp (C2W2L07)
Adam optimizer (Andrew Ng)	Adam Optimization Algorithm (C2W2L08) <i>Warning: Scary math ahead</i>
Adagrad optimizer (minutes 5:29 - 9:19)	L26/1 Momentum, Adagrad, RMSProp, Adam

Cross Entropy	
Title	Link
Entropy, Cross Entropy ... (Aurelien Geron)	https://www.youtube.com/watch?v=ErfnhcEV1O8



Batch Normalization	
Title	Link
Batch Norm (Andrew Ng)	Why Does Batch Norm Work? (C2W3L06)
Batch Normalization (DeepLizard)	Batch Normalization ("batch norm") explained

Embeddings

Title	Link
Quick overview of the concept of embeddings	 Embeddings
Embeddings developed using GloVe	 NLP for Developers: Word Embeddings Rasa

Natural Language Processing / Transformer

NOTE: You are not required to know NLP beyond the basics. The following resources cover additional topics that are not part of the interview but will prepare you for more advanced student questions should they arise.

Title	Link
Attention Is All You Need (December 6, 2017)	https://arxiv.org/pdf/1706.03762
BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding (October 11, 2018)	https://arxiv.org/pdf/1810.04805.pdf
Stanford CS224N: NLP with Deep Learning – Winter 2019 Transformers & Self-Attention	 Stanford CS224N: NLP with Deep Learning Wi...
Consider also reading papers / videos on:	
NVIDIA's Megatron	https://arxiv.org/pdf/1909.08053.pdf
OpenAI's GPT2 / GPT3	Video  GPT 3 Demo and Explanation - An AI revolution f... Paper - Language Model for Few-Shot Learners https://arxiv.org/pdf/2005.14165.pdf
Microsoft's Turing-NLG	