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Created: September 22, 2022
Last Updated: September 30, 2022

Deep Learning Resources

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1 Deepsearch

1. Batch Normalization
2. Adam Optimizer
3. Xavier Initialization
4. Kaiming Initialization

2 General

1. “Training Neural Networks I.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Modeling a Neuron, Activation Functions, ReLU*]

3 Data Preprocessing

1. “Training Neural Networks II.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Mean Subtraction, Normalization, PCA and Whitening*]

3.1 Weight Initialization

1. “Training Neural Networks II.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Pitfalls All Zero, Small Random Numbers, Calibrating Variances, Batch Normalization*]
2. He et al, “Delving Deep into Rectifiers: Surpassing Human-Level Performance on ImageNet Classification”, ArXiv 2015 [*Original Kaiming Initialization Paper*].
3. Glorot, Xavier and Bengio, Y.. (2010). Understanding the difficulty of training deep feedforward neural networks. Journal of Machine Learning Research - Proceedings Track. 9. 249-256. [*Xavier Initilization Paper*]

3.2 Batch Normalization

1. Sergey Ioffe and Christian Szegedy, “Batch Normalization: Accelerating Deep Network Training by Reducing Internal Covariate Shift” , ICML 2015. [*Batch Normalization Paper*]

4 Loss Functions

1. “Training Neural Networks I.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Problem of Large Number of Classes, Attribute Classification, Regression v. Classification*]

5 Architectures

1. “Training Neural Networks I.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Layer-Wise Organization, Naming Conventions, Ex. Feed-forward, Representational Power, Capacity*]
2. He, Kaiming, et al. “Deep residual learning for image recognition.” Proceedings of the IEEE conference on computer vision and pattern recognition. 2016. [*ResNet Architecture*]
3. He, Kaiming, et al. “Identity mappings in deep residual networks.” European conference on computer vision. Springer, Cham, 2016.[*Pre-Resnet*]

6 Hyperparameters

6.1 Update Rules

1. “Training Neural Networks III.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*SGD, Momentum, Nesterov Momentum, Adagrad, RMSprop, Adam*]
2. Diederik Kingma and Jimmy Ba, “Adam: A Method for Stochastic Optimization”, ICLR 2015 [*Original Adam Paper*]

6.2 Regularization

1. “Training Neural Networks II.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*L2, L1, Max Norm Constraints*]

6.3 Dropout

1. “Training Neural Networks II.” CS231N Convolutional Neural Networks for Visual Recognition, Stanford University, 2022. [*Dropout, Inverted Dropout, Code Implementation*]
2. Srivastava et al. “Dropout: A Simple Way to Prevent Neural Networks from Overfitting.” University of Toronto, 2014
3. Hinton, Geoffrey E. et al. “Improving neural networks by preventing co-adaptation of feature detectors.” ArXiv, 2012. [*Dropout*]

7 Hardware and Software

1. Chadha, Amani. “CS231N Deep Learning Hardware and Software.” Aman’s AI Journal, 2020.