

Author: Benjamin Smidt  
Created: September 22, 2022  
Last Updated: September 23, 2022

# Deep Learning Resources

## Contents

<b>1</b>	<b>General</b>	<b>2</b>
<b>2</b>	<b>Data Preprocessing</b>	<b>2</b>
2.1	Weight Initialization . . . . .	2
<b>3</b>	<b>Loss Functions</b>	<b>2</b>
<b>4</b>	<b>Architectures</b>	<b>2</b>
<b>5</b>	<b>Hyperparameters</b>	<b>3</b>
5.1	Update Rules . . . . .	3
5.2	Regularization . . . . .	3
5.3	Dropout . . . . .	3
<b>6</b>	<b>Hardware and Software</b>	<b>3</b>

## 1 General

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

## 2 Data Preprocessing

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

### 2.1 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*]

## 3 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*]

## 4 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*]

## 5 Hyperparameters

### 5.1 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*]

### 5.2 Regularization

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

### 5.3 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.

## 6 Hardware and Software

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