Assessment of Several Loss Functions and Optimization Strategies for Pneumonia Detection

Proceedings of the KILBY 100 7th International Conference on Computing Sciences 2023 (ICCS 2023)

6 Pages • Posted: 13 Aug 2024

Mithu Mal (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=6753031)
Dr. B. C. Roy Engineering College, Durgapur

Biswajit Mondal (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=6753034)
Dr. B. C. Roy Engineering College, Durgapur

Joyjit Patra (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=6753036)
Dr. B. C. Roy Engineering College, Durgapur

Subir Gupta (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4631667)
Swami Vivekananda University

Date Written: May 5, 2023

Abstract

The loss function and the optimizer are two important parts of machine learning that are used to train models. Together, these components ensure that the model learns to generate correct predictions. The loss function is used to measure the deviation of a model's outputs from their expected value. Humans frequently use the terms "loss" and "cost" to characterize this transformation. During training, the loss function reduces the likelihood of the model making inaccurate predictions. By choosing the loss function carefully, the study can make sure the model learns to make accurate predictions and gets the best results. In machine learning, different loss functions are utilized for different types of issues. During training, the optimizer modifies the model's parameters to minimize the loss function. The optimizer seeks a value for each criterion that results in the lowest loss. Stochastic gradient descent (SGD), Adam, and RMSprop are all examples of optimizers that use different ways to fine-tune a model's parameters. The choice of optimizer can have a big effect on both how long it takes for the model to converge and how accurate it is. For the model to work, it is important to use the right loss function and optimizer. A poor choice of loss function results in inaccurate predictions and sluggish convergence, while a poor choice of optimizer results in a model that is not as good as it could be. So, it's very important to choose the best loss function and optimizer for the job. Every machine learning system that wants to work well needs both a loss function and an optimizer. These components are necessary for the model to learn and generate reliable predictions. By utilizing the appropriate loss function and optimizer, the study can ensure that the model functions properly and yields the best results. Using pneumococcal imaging datasets, researchers determined the best loss function and optimization function. The findings of the study indicate that mse and sgd are superior to evaluate accuracy of epochs and test and train in terms of CNN model prediction.

Note:
Funding Information: None to declare.

Declaration of Interests: None to declare.

Keywords: SGD, Adam, and RMSprop

Suggested Citation:

Mal, Mithu and Mondal, Biswajit and Patra, Joyjit and Gupta, Subir, Assessment of Several Loss Functions and Optimization Strategies for Pneumonia Detection (May 5, 2023). Proceedings of the KILBY 100 7th International Conference on Computing Sciences 2023 (ICCS 2023), Available at SSRN: https://ssrn.com/abstract=4834084 (https://ssrn.com/abstract=4834084)

16 References

1. A Abdelaziz , M Elhoseny , A S Salama , A M Riad
A machine learning model for improving healthcare services on cloud computing environment
Meas. J. Int. Meas. Confed , volume 119 , p. 117 - 128 Posted: 2018

2. A A A Setio
Pulmonary Nodule Detection in CT Images: False Positive Reduction Using Multi-View Convolutional Networks
IEEE Trans. Med. Imaging , volume 35 , issue 5 , p. 1160 - 1169 Posted: 2016

3. H R Roth
DeepOrgan: Multi-level Deep Convolutional Networks for Automated Pancreas Segmentation BT -Medical Image Computing and Computer-Assisted Intervention --MICCAI 2015 , p. 556 - 564 Posted: 2015

4. N Navab , J Hornegger , W M Wells , A F Frangi
proceedings, part III
18th International Conference , volume 9351 , p. 12 - 20 Posted: 2015-10-05

0 Citations