

Comprehensive Study for Diabetes Identification Ability of Various Optimizers in Deep Learning Neural Network

Authors ESK Chandrasekara, WKT Kanchana, EJKP Nandani

Publication date 2021/12/6

Conference 2021 5th SLAAI International Conference on Artificial Intelligence (SLAAI-ICAI)

Pages 1-6

Publisher IEEE

Date Added to IEEE Xplore
05 January 2022

ISBN Information

Electronic ISBN:978-1-6654-0655-0

Print on Demand(PoD) ISBN:978-1-6654-0656-7

INSPEC Accession Number: 21531980

DOI: [10.1109/SLAAI-ICAI54477.2021.9664721](https://doi.org/10.1109/SLAAI-ICAI54477.2021.9664721)

Conference Location:

Colombo, Sri Lanka

Abstract

learn Diabetes or Diabetes mellitus is one of the major public health problems in the world, and it arises at the pancreas does not supply sufficient insulin or the body unable to use that insulin effectively. Although there is no definitive cure for this disease, accurate detection is very important since diabetes causes heart attack and stroke, and damage to the kidney, eyes, nerve, etc. Nowadays, many researchers have engaged in identifying diabetes disease with numerous Artificial Intelligence (AI) techniques due to the complexity of the problem. This study discovered that the Diabetes identification ability of the Deep Learning Neural Network together with different optimizers, namely Adam, SGD, RMSprop, and Adagrad. Moreover, stratified 5-fold Cross-validation was applied to learn the model referring to the Pima Indian Diabetes Dataset (PIDD) which is an imbalanced limited data set. The performance accuracy of the optimizers was compared by using the Area Under Curve (AUC) score of the Receiver Operating Characteristic (ROC) curve. In addition, Sensitivity, Specificity, Balanced accuracy, precision, and F1-Score measurements were used to compare the classification accuracy of the predictions. The findings of this study revealed that the Adams optimizer obtained the best results in the diabetes classification by using the DNN model with imbalanced data set. Meanwhile, AdaGrad optimizer scored the lowest results.