

Deep LSTM model for diabetes prediction with class balancing by SMOTE

ABSTRACT

Diabetes is an acute disease that happens when the pancreas cannot produce enough insulin. It can be fatal if undiagnosed and untreated. If diabetes is revealed early enough, it is possible, with adequate treatment, to live a healthy life. Recently, researchers have applied artificial intelligence techniques to the forecasting of diabetes. As a result, a new SMOTE-based deep LSTM system was developed to detect diabetes early. This strategy handles class imbalance in the diabetes dataset, and its prediction accuracy is measured. This article details investigations of CNN, CNN-LSTM, ConvLSTM, and deep 1D-convolutional neural network (DCNN) techniques and proposed a SMOTE-based deep LSTM method for diabetes prediction. Furthermore, the suggested model is analyzed towards machine-learning, and deep-learning approaches. The proposed model's accuracy was measured against the diabetes dataset and the proposed method achieved the highest prediction accuracy of 99.64%. These results suggest that, based on classification accuracy, this method outperforms other methods. The recommendation is to use this classifier for diabetic patients' clinical analysis.