**ABSTRACT**

Healthcare industry is undergoing changes at a tremendous rate due to healthcare innovations. Predictive analytics is increasingly being used to diagnose the patient’s ailments and provide actionable insights into already existing healthcare data. The paper looks at a decision support system for determining the health status of the foetus from cardiotographic data using deep learning neural networks. The foetal health records are classified as normal, suspect and pathological. As the multiclass cardiotographic datset of the foetus shows a high degree of imbalance a weighted deep neural network is applied. To overcome the accuracy paradox due to the multiclass imbalance, relevant metrics such as the sensitivity, specificity, F1 Score and Gmean are used to measure the performance of the classifier rather than accuracy. The metrics are applied to the individual classes to ensure that the positive cases are identified correctly. The weighted DNN based classifier is able to classify the positive instances with Gmean score of 91% which is better than than the SVM classifier.