Data Mining Techniques in Normal or Pathological Infant Cry

Yadisbel Martinez Cañete
Sergio Daniel Cano Ortiz
Lienys Lombardía Legrá
Ernesto Rodríguez Fernández
Liette Veranes Vicet

Universidad de Oriente. Cuba.{ymartinez,scano,lienys,ernesto, liette.veranes}@uo.edu.cu

Abstract.

The infant cry is the only means of communication of a baby and carries information about its physical and mental state. The analysis of the acoustic infant cry waveform opens the possibility of extracting this information, useful in supporting the diagnosis of pathologies since the first days of birth. In order to obtain this useful information, it is first necessary to acquire and to process the cry signal, being the latter an arduous and tedious process if performed manually. Because of this, it is necessary to develop a system that allows the extraction of the information present in the cry, automatically, that greatly facilitates the work of pediatricians and specialist doctors. The present work evaluates some data mining techniques in standard configurations, for the classification of normal or pathological infant cry in support of the diagnosis of diseases in the Central Nervous System. Evaluation is performed comparing seven classifiers: Naïve Bayes, Simple Logistic, SMO, IBk, Decision Table, J48 and Random Forest, on acoustic attributes Linear Prediction Coefficients and Mel Frequency Cepstral Coefficients and two different testing options: 10-fold cross-validation, and Supplied test set. Best results are obtained with the IBk and Random Forest methods, with receiver operating characteristics (ROC) areas of .923 and .956, respectively.

Keywords: *Infant cry analysis, Data mining, MFCC, LPC Supervised classification*

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