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Prediction of menarcheal status of girls using voice features

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Abstract

A method for evaluating the menarcheal status of girls on the basis of their voice features is presented in the paper. The registration procedure consists of voice recording and measuring 20 anthropological features. The input feature vector is a combination of voice and anthropometric parameters, counting 220 features. The optimal set of parameters was selected using five different methods: Method A – stepwise regression (first forward, then backward regression) performed on features with statistically different means/medians; Method B – stepwise regression (forward and backward) on all features, with age; Method C – stepwise regression as in B; including age, Method D – all features with statistically different means/medians, Method E – all features excluding age. For classification purposes three methods were employed: random forest (RF), support vector machine (SVM) and linear discriminant analysis (LDA) classifier. They were tested with 10-fold cross validation. The classification accuracy for RF using only voice fea-

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