A Snoring Classifier Based on Heart Rate Variability Analysis

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The effects of snoring on the cardiovascular system is not well known, we propose a suite of linear and nonlinear analyses of the Heart Rate Variability (HRV) to classify snoring patients and healthy normal controls. The analysis is performed on full whole night polysomnography with ECG and audio channels. The corresponding patient group and control group are gender and age paired, both of which has 6 females and 6 males, totally 24 people. HRV index and the low frequency (LF) and high frequency (HF) parameters are calculated using sliding window. The nonlinear analysis including Poincare Plots and Detrended Fluctuation Analysis (DFA) are employed. Ellipse fitting technique is used on Poincare Plots to obtain SD1 and SD2. Due to the crossover pattern of scaling exponent of DFA, two parameters a1 and a2 corresponding to short-term and long-term time windows are extracted. The features extracted from the HRV analysis are feed into a Hybrid Fuzzy Artificial Neural Network classifier to perform classification of snoring and normal people. The result of the classifier is promising and the analysis of the most significant feature space could provide a deeper insight into the physiological understanding of snoring.