

Automatic Speaker Recognition Techniques: A New Tool for Sleep Apnoea Diagnosis.

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The acoustic properties of speakers suffering from sleep apnoea-hypopnea syndrome (SAHS) are not clear, and not much research has been made on it. However, there are some studies pointing at possible abnormalities in phonation, articulation and resonance. In this work, we explore the possibilities for the adaptation of Automatic Speaker Recognition techniques (ASR) to severe apnoea cases diagnosis (apnoea-hypopnea index up to 30). The proposed system is based on Gaussian Mixture Models (GMMs), which represents the state-of-the-art for speaker recognition. ASR uses signal processing algorithms on continuous speech. Method: 80 male patients were included (40 controls, 40 SAHS). They were recorded while reading 4 sentences three times and a sustained vowel /a/ also three times. Table 1 provides the correct classification rates obtained. An overall correct classification of 81.25% is reached on this task. Table 2 shows the statistical measures of the performance for the same task. Fisher exact test $p < 0.0001$ revealed statistically significant.

Correct Clasification Rate

	Control Group(31/40)	Apnoea Group(34/40)	Overall(65/80)
Correct Overall in %	77,50	85	81,25

Sensibility and Specificity of diagnostic test

Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value
77.50% (31/40)	85 % (34/40)	83.78% (31/37)	79.06% (34/43)

Conclusions: ASR is a very promising tool for screening more severe sleep apnoea patients.

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