CLASSIFICATION OF PHONATION MECHANISMS IN PROFESSIONAL TENORS: A COMPARISON BETWEEN EGG-BASED AND GAW-BASED CLUSTERING

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This paper uses clustering to investigate the relationship between the electroglottogram (EGG) and the glottal area waveform (GAW) extracted by high-speed video (HSV) recordings in professional singers (tenors). While the EGG signal gives information about the contact phase it gives no information whatsoever for the open phase of the vibratory cycle. Conversely, HSV provides information for the open phase; thus the two measures complement each other. This study uses both the shapes of the EGG cycle waveforms and the shapes of the GAW cycle waveforms to characterize vibratory cycles and automatically categorize them using k-means clustering. The results were checked against a ground truth for the mechanism of phonation to quantify the error rate of the clustering. It was found that the error rate was similar for GAW and EGG based clustering, of the order of 7% (GAW) and 10% (EGG) respectively, for a database of 5967 vibratory cycles. In conclusion there seems to be no significant advantage of the GAW over the EGG for the automatic categorization of phonation mechanisms in singing.