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Classification of normal and pathological vocal fold vibrations
using Phonovibrograms

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Clinical examination of voice disorders demands an endoscopical observation of vocal fold vibrations. High-speed endoscopy is the state-of-the-art technology for investigation of vocal fold vibrations. A novel visualization strategy is proposed which transforms the segmented contours of vocal fold edges into a set of two dimensional images, denoted Phonovibrograms (PVG). Within PVGs the individual type of vocal fold vibration becomes uniquely characterized by specific geometric patterns which can be seen as fingerprints of vocal fold vibration. The PVGs give an intuitive access on the type and degree of the laryngeal asymmetry which is essential to quantify the effects of functional and organic voice disorders. To determine the vibration characteristics within the computed PVG pattern recognition algorithms are applied. Thus, for each vocal fold the vibration type can be quantified and classified. The results of the PVG classification will be presented in 80 subjects (normal and pathological voices). It will be shown, that a classification of the vibration type can be performed very precisely even in disturbed vocal fold vibrations. The obtained PVG images can be documented and stored on a hard-disc using a lossless image data-format. The quantitative description of PVG patterns has the potential to realize a novel classification of vocal fold vibrations.