OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Exhibition on
Otolaryngology

October 15-17, 2012 DoubleTree by Hilton Chicago-Northshore, USA

Image processing techniques to support vocal pathologies diagnosis

A. Mendez Zorrilla[1], B. García Zapirain[1] and A. Pérez Izquierdo[2]
[1]University of Deusto, Spain
[2]Basurto Hospital, Spain

Nowadays, clinical examination of the voice is gaining great importance and interest, due to social demand (society in general and the complex world of oral communication) and technological advances in the field of computer science, engineering, telecommunications (signal processing). Any alteration in the larynx or vocal cords may not only cause health problems but can also result in communication problems.

Currently the accepted methods to diagnose vocal pathologies using image analysis are: Video laryngostroboscopy (VLS) and Digital High Speed Video endoscopy (HSV). We can consider HSV like the most extended one.

Therefore, the development and application of new digital image processing algorithms will provide doctors with automated aid in diagnosis, as well as all the tools and data necessary for the final diagnosis to be as rigorous as possible.

All kind of pathologies, whether morphological or related to movement, can be characterized using objective parameters, without neglecting the importance of perceptual analysis. The objective parameters studied by the authors are: glottal closure (complete/incomplete), size of the morphological pathology (polyp, nodule…), the percentage opening/movement of one cord in relation to the other. All the mentioned parameters are calculated automatically.

Given the features of VLS or HSV images, it is necessary to perform the processing in several stages using advanced image processing techniques like: Denoising, Gabor Filtering to segment the images, Adapted Block Matching to study the movement, and Fisher Discriminant and Principal Component Analysis to automatically classify the pathology.

Moreover, to combine acoustic analysis with image processing following the ELS (European Laryngological Society) recommendations could be interesting; for instance, to provide specialists with a complete report which contains data that supports their diagnostic hypothesis and which measures progress in case of rehabilitation or surgery.

Biography

A. Méndez Zorrilla was born in Barakaldo (Spain). She graduated in Technical Industrial Engineering, specializing in Electronics in 1999 at the University of Deusto (UD). Later, in 2001, she graduated in Telecommunications Engineering at the same university. She has her thesis registered in Biomedical engineering. She has been a lecturer at UD since 2003 and is part of the Telecommunications department in UD. She became part of the Advanced Signal Processing (PAS) research group at UD in 2005.

amaia.mendez@deusto.es