6th INTERNATIONAL WORKSHOP
MODELS AND ANALYSIS OF VOCAL EMISSIONS FOR BIOMEDICAL APPLICATIONS
December 14-16, 2009
Firenze, Italy
PROCEEDINGS
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FOREWORD

It is a great pleasure for me to introduce this 6th edition of the Proceedings of the MAVEBA Workshop, devoted to the relevant topic of voice modelling and analysis under a biomedical perspective.

MAVEBA 2009, the 6th event of this series, celebrates ten years of scientific uninterrupted success. The attendance of researchers from all over the world, that has always distinguished this event, makes me proud and stimulates in pursuing this initiative in the future.

Since its first edition in 1999, the series of MAVEBA workshops aims to fill the gap between different research fields on human voice that historically developed independently from each other. This meeting stimulates contacts between specialists active in clinical, research and industrial developments in the area of voice signal and images analysis for clinical treatment, care and rehabilitation and other biomedical applications, aiming at gathering together knowledge, experience and technology from researchers coming from a wide range of institutions.

The MAVEBA Workshop is organised every two years in Firenze, Italy. This sixth Workshop offers again the participants an interdisciplinary platform for presenting and discussing new knowledge in the field of models and analysis of voice signals and images, as far as both adults, singing and children voices are concerned, ranging from fundamental research to all kinds of biomedical applications and related established and advanced technologies. Modelling the normal and pathological voice source and the analysis of healthy and pathological voices are among the main fields of research. The aim is that of extracting the main voice characteristics, together with their deviation from “healthy conditions”. This needs to result in developing accurate, objective and clinically useful methods of investigation of voice quality in patients, and of strategies for preventing occupational voice disorders in professional speakers.

Modelling is one of the hot topics in voice analysis to which the international community devotes great efforts. It has strict links with other equally important fields of research such as:

- diagnosis and classification of pathological voice
- monitoring voice quality during rehabilitation
- development of vocal prostheses and aids for disabled
- analysis of other vocal emissions (infant cry, cough, snoring, swallowing), in neurological dysfunctions, obstructive apnoea, asthma, etc.
- protocols and reliable objective parameters form images through videolaryngoscopy, videokymography, fMRI and other emerging techniques
- emotional voice as related to psychological/neurological conditions, e.g. epilepsy, autism, schizophrenia, stress etc.
- interaction with hearing impairments
- relationships among subjective-perceptive-objective voice analysis

From this long and non-exhaustive list, it appears that the need for interaction between different fields of research has become of utmost importance. The subject of voice analysis has recently gained more and more attention from the international community and is rapidly growing, and in the last ten years links and cooperation among different research fields have become effective to define and set up simple and reliable tools
for voice analysis. A deeper insight into the voice production mechanism and its relevant parameters could in fact help clinicians in improve prevention and treatment of vocal apparatus pathologies.

The interest is also demonstrated by several initiatives that have been set up all over the world that focus on voice. In 2002, April 16, the American Academy of Otolaryngology--Head and Neck Surgery founded the World Voice Day, to encourage men and women, young and old, to assess their vocal health and take action to improve or maintain good voice habits. The World Voice Day is now celebrated worldwide, jointly by the clinical and the biomedical engineering community.

Moreover, both in 2007 and in the present 2009 edition, the MAVEBA Workshop has hosted the Management Committee and Working Groups meetings of COST Action 2103 “Advanced Voice Function Assessment”, a 4-years lasting (2006-2010) joint initiative of speech processing teams (engineers and physicists) and the European Laryngological Research Group (ELRG) (laryngologists/phoneticians). A main objective of COST 2103 is in fact a better understanding of the relationship between biomechanical changes of the vocal folds and alterations of the acoustical voice signal. Modelling normal and pathological voice source is an essential tool in this process.

We are definitely moving towards interdisciplinary research, made easier by worldwide fast communication capabilities. Thus great effort should also be directed towards setting up a common framework among all interested researcher and companies. This would be of great help to finalise and speed up research, enhance methodological results, increase and update the production of dedicated, user-friendly and cheap devices and, most important, sensitising people on a still underestimated subject, such as the prevention of vocal apparatus pathologies.

Within this volume of Proceedings, papers range from fundamental research to development and testing of software tools and measurement devices. Specifically, the volume includes three Special Sessions organized and given by worldwide well-known experts on:

- Newborn Infant Cry
- Voice Modelling
- Singing Voice

And other six Sessions on the following topics:

- Emotional Voice
- Voice Quality Assessment
- Voice Images
- Devices
- Obstructive Sleep Apnoea
- Mechanical Models

Some papers on the above mentioned topics are presented during the Workshop in the poster session. From these papers, and those collected in Special Issues of international Journals: Medical Engineering & Physics (2002), Biomedical Signal Processing and Control (2006, 2009), Acta Acustica - Acustica (2006) devoted to past MAVEBA Workshops, I hope that the interested reader could find useful suggestions and further spurs to carry on research in the important and increasing field of voice analysis.

Finally, I express my gratitude to the members of the organising committee, the anonymous reviewers that helped in improving the quality of the papers, the supporters and sponsors who confidentially gave financial contribution, the administrative staff of the Department of Electronics and Telecommunications that contributed to make this Workshop a successful one.

Claudia Manfredi
Conference Chair