

DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Along with the growing importance of the communication process early diagnosis of occupational voice disorders becomes a priority for public health, both in Poland and in other countries of the European Union. Hitherto conducted voice diagnosis is based on a subjective judgment by the phoniologist. Currently, European standards emphasize the need for a comprehensive assessment of voice disorders including evaluation of the larynx functioning, carried out during the phoniatric examination.

Laryngovideostroboscopic examination enables imaging the glottis during phonation in the so called slow motion. Application of computer based image analysis techniques allows for quantitative evaluation of the vibration process of the vocal folds.

The aim of the project is to develop methods of computer analysis of laryngovideostroboscopic image sequences of vocal folds and automatic determination of parameters characterizing the examined phonatory process. These parameters are the coefficients describing the geometric shape of the vocal folds and the so-called kinematic coefficients characterizing their vibration (i.e. vibration frequency, the speed of opening/closing of the folds, etc.).

A novel research approach proposed in the project is the use of image processing methods, that will allow reconstruction of a three-dimensional shape of the vocal folds during vibration. The proposed method is based on a combination of information about the shape of the vocal folds and its variations in the sequence of images. This approach, which has not been earlier published, will enable novel imaging quality and early detection of fold's disorders (such as polyps, nodules or regurgitation of the vocal cords). Early diagnosis will make a more effective treatment possible and may prevent complications resulting from mechanical damage to the vocal folds due to their excessive load.

The conducted study may provide a basis for the development of standards for objectified evaluation of the state of health of the vocal folds, especially in people working with voice (teachers, teleconferencing centers, actors, singers, journalists).

The developed image processing and analysis methods of laryngovideostroboscopic images may be useful in other areas of medical imaging.