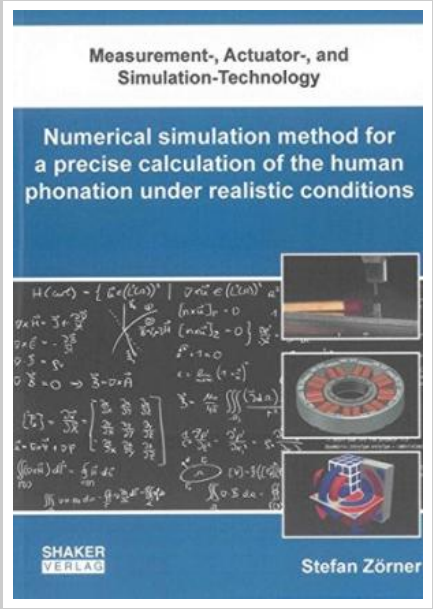

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Numerical simulation method for a precise calculation of the human phonation under realistic conditions

By Stefan Zörner

Shaker Verlag Apr 2014, 2014. Buch. Book Condition: Neu. 21x14.8x cm. Neuware - The human voice is essential for day-to-day communication. Consequently, impairment of speech, known as dysphonia, may have a significant impact on a person's career and possible even their social life. To understand the mechanisms and effects that distinguish a healthy voice from an unhealthy one, the phonation process itself must be understood. In the case of human phonation, computer aided simulation is a useful tool, as it is non-invasive. However, if the target is to achieve an exact replica, the complex nature of the phonation process pushes the bounds of current research and also demands high computational capacities. Simplifications in the model are therefore necessary to counteract these problems. This thesis analyses different kinds of simplifications and the error which is caused by the corresponding model. These investigations were carried out with the simulation tool CFS++, and extended to allow for a precise simulation of the interaction between air flow and structural (vocal fold) vibration. Furthermore, it is also capable of determining the acoustic sources and propagation of aeroacoustical and vibration-induced sound. Firstly, the impact of the geometrical shape of the vocal folds is studied. Thereby, a...

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