

An algorithm for pseudo-3D representation of the contour of the tongue while playing the didgeridoo

Introduction: In 1981 the importance of ultrasound images for the analysis of tongue movements was shown for the first time. As a result, algorithms have been developed for examining the ultrasound data with technological support. About a quarter century later the demand for a tongue contour segmentation algorithm based on current technological potential arose. **Method:** The developed algorithm processes mediosagittal B-mode images to a pseudo-3D representation of the tongue contour. Therefore, the processing steps smoothing, segmentation and pseudo-3D representation are applied to cross section image stacks. The main step (segmentation) deals with the detection, optimisation and completion of edges in grey value ultrasound images. In this context, pseudo-3D representation stands for the illustration of an image stack in the course of time rather than for a virtual three-dimensional representation. **Results:** Applying the algorithm to images recorded while playing the didgeridoo shows satisfying results for arbitrary ventral as well as dorsal views. But, under certain conditions artefacts might occur due to an unsatisfying signal-to-noise relation. **Conclusion:** Results show improvement opportunities concerning technical optimisation like advanced transducer technology or further algorithm development. Moreover, the algorithm is applicable to other wind instruments and also for medical implications like sucking, swallowing or running speech.