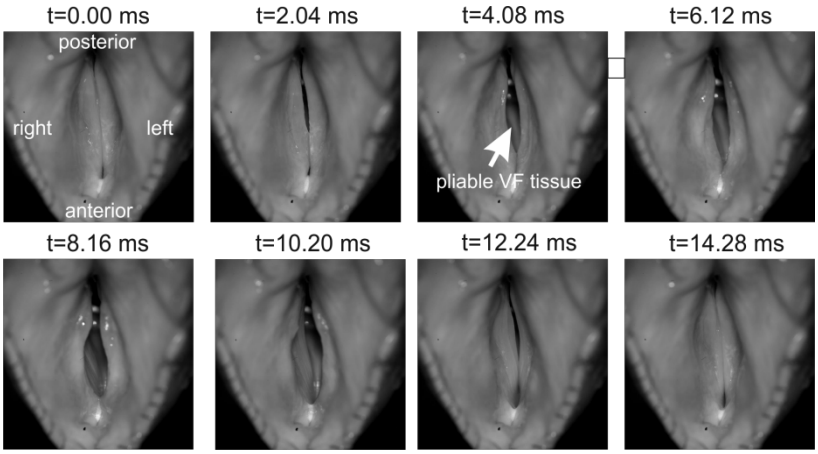
LEHRSTUHL FÜR MUSTER-ERKENNUNG

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Master Thesis

Segmentation of the Vocal Folds during Phonation

Voice disorders such as hoarseness have various causes. In order to help in the diagnosis and treatment a multi-disciplinary team is required that consists of computer scientists, engineers, physicists, and medical doctors. We investigate the phonatory process in cadaver larynx models (e.g. sheep, pigs, cows) with multi-modal methods. The voice producing organ consists of the oscillating vocal folds (100 – 400 Hz). The most important tool is high-speed imaging (recording rates: 4000 – 8000 fps) that allows the visualization of the phonatory process. The figure shows a typical oscillatory cycle of vocal folds in a sheep model recorded by a high-speed camera.
The **task of the thesis** is to investigate image processing algorithms that allow for the fast and robust segmentation of the glottis. In the figure, the glottis can be recognized as the darker area in the middle between the vocal folds that opens and closes during the vocal fold oscillations.



The work will be done in cooperation between **Prof. Dr-Ing. Andreas Maier** at the Pattern Recognition Lab and **Prof. Dr.-Ing. Michael Döllinger** (UKE). There is a long-time cooperation between both supervisors.

We search for a dedicated and motivated student with

- Knowledge in image processing
- experience in Matlab and C#

Tasks:

- Investigating of image processing algorithms (e.g. SIFT, SURF, Viola-Jones Algorithm, and newer variants)
- Implementation of the final algorithms in into an existing software framework

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