Visual Computing Forum

UNIVERSITAS BERGENSIS

Modeling the human larynx for simulation of airflow during exercise

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Abstract

Obstruction of the central airways is typically expressed by exercise-induced inspiratory symptoms (EIIS) and is an important cause of exercise induced dyspnea in young and otherwise healthy individuals.

We are constructing a computational model for the larynx that will be used to simulate the airflow. The aim is to understand the larynx's role for breathing problems: which obstructions leads to problems, and why.

To obtain the proper laryngeal geometry we use a combination of MRI and CT data acquired at HUS and NMBU. Our computational model is based on image and laryngoscopy data, and constructed using COMSOL Multiphysics, a finite-element based software package widely used in computer-aided engineering.

The simulations aim to uncover the effect of geometry changes in the supraglottic region on the characteristics of the airflow through the larynx.