

Three-dimensional vocal tract reconstructions

Three-dimensional reconstructions of vocal tract shapes based on image sets collected with magnetic resonance imaging (MRI) and x-ray computed tomography (CT) are shown on the next three pages. The VT shapes in the left column were obtained from the same adult male talker and were originally presented in the first two publications listed below. In the right column are VT shapes of an adult female talker; these were originally presented in the third publication listed below.

- Story, B. H., 1995. *Physiologically-based speech simulation using an enhanced wave-reflection model of the vocal tract*. Ph. D. Dissertation, University of Iowa.
- Story, B.H., Titze, I.R., Hoffman, E.A., (1996). Vocal tract area functions from magnetic resonance imaging, *J. Acoust. Soc. Am.*, 100(1), 537-554. doi: 10.1121/1.415960.
- Story, B.H., Titze, I.R., and Hoffman, E.A., (1998). Vocal tract area functions for an adult female speaker based on volumetric imaging, *J. Acoust. Soc. Am.*, 104(1), 471-487.

Figure 1: MR-based vocal tract reconstructions

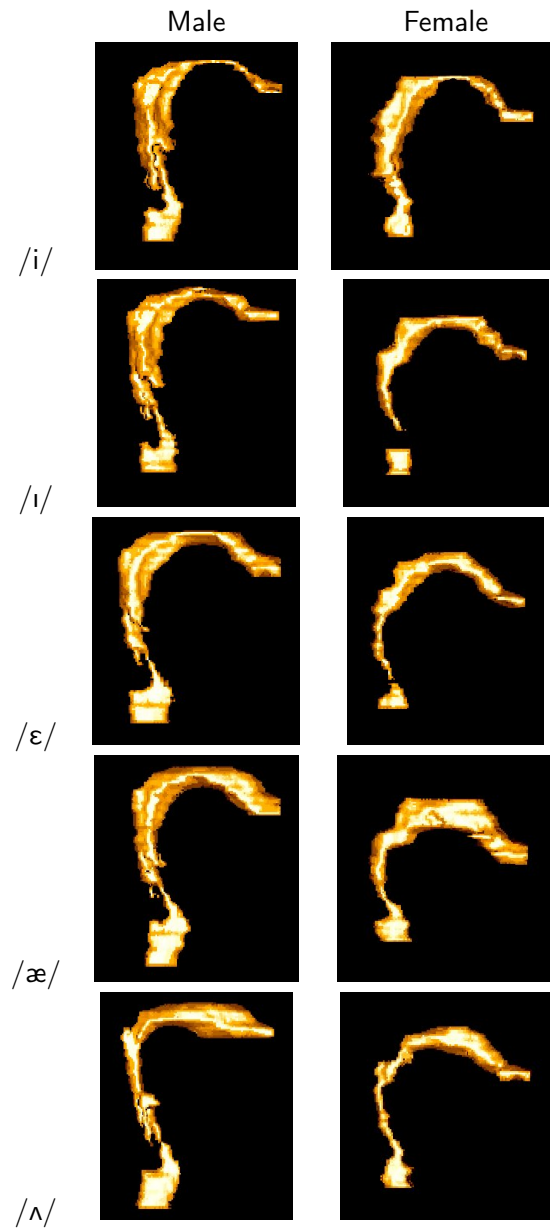


Figure 2: MR-based vocal tract reconstructions

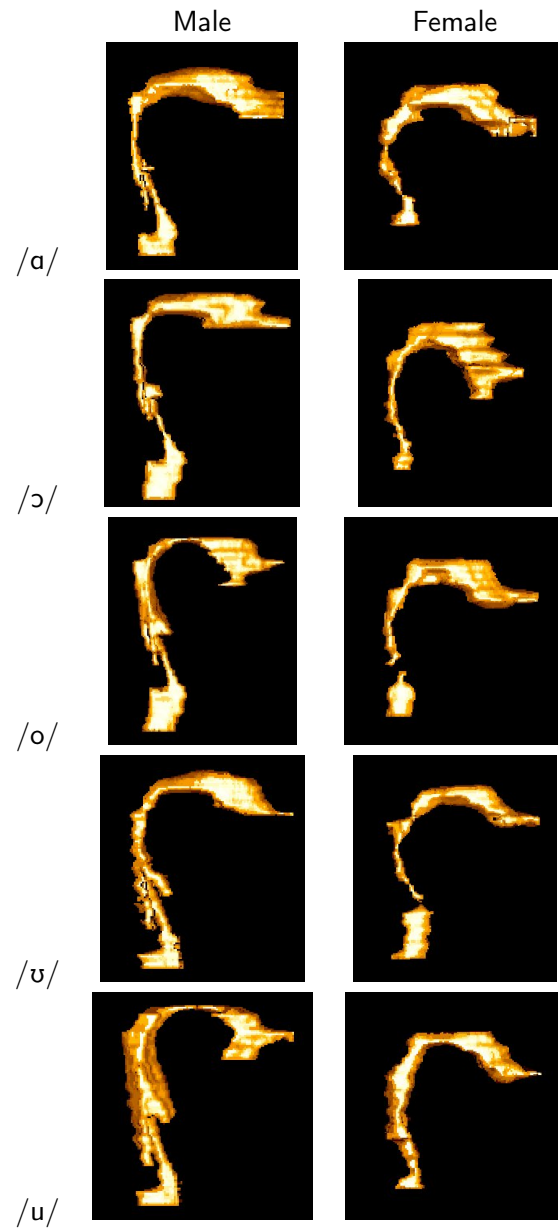


Figure 3: MR-based vocal tract reconstructions

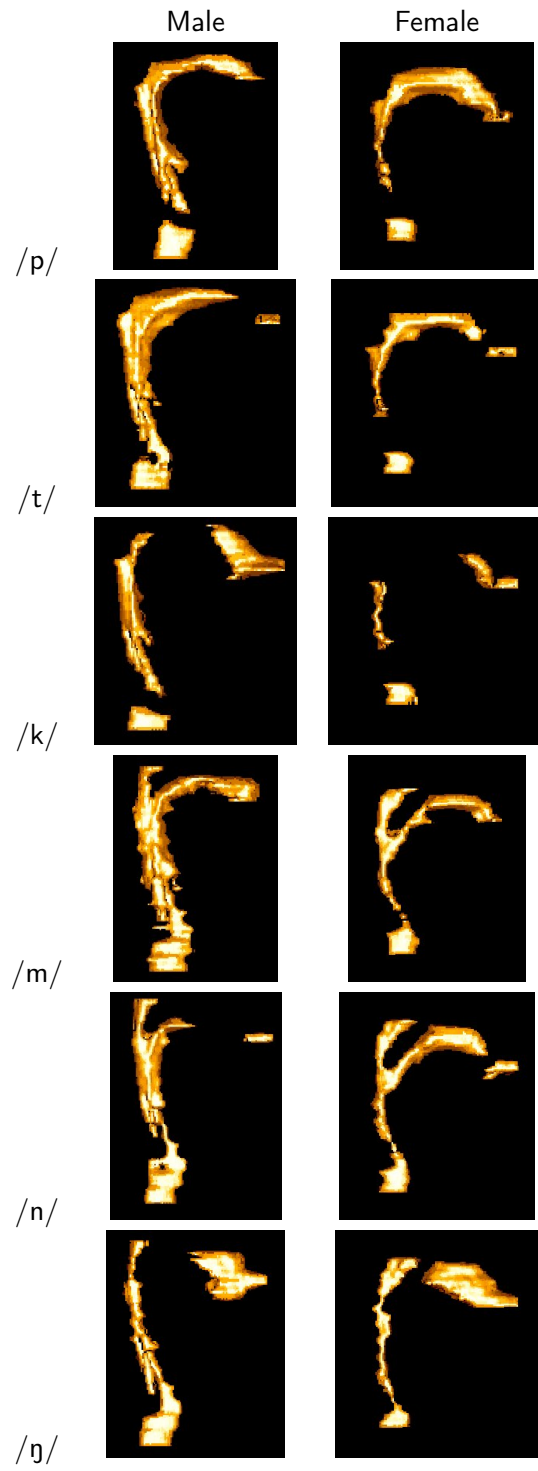


Figure 4: MR-based vocal tract reconstructions

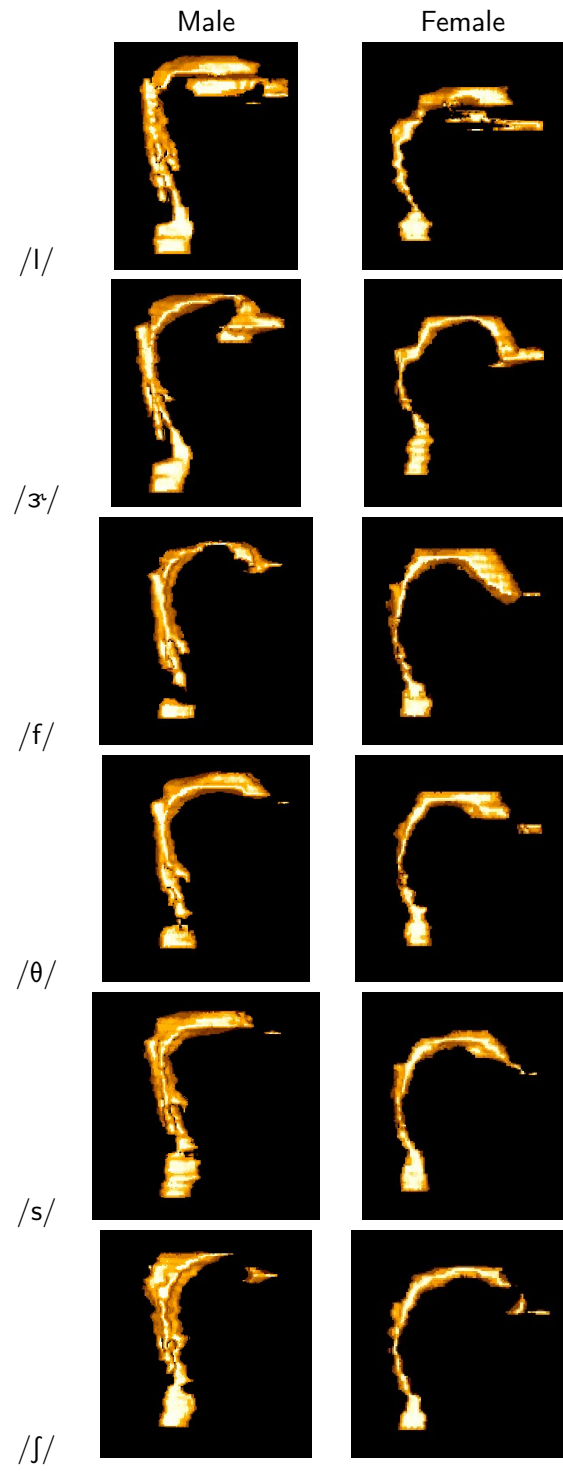
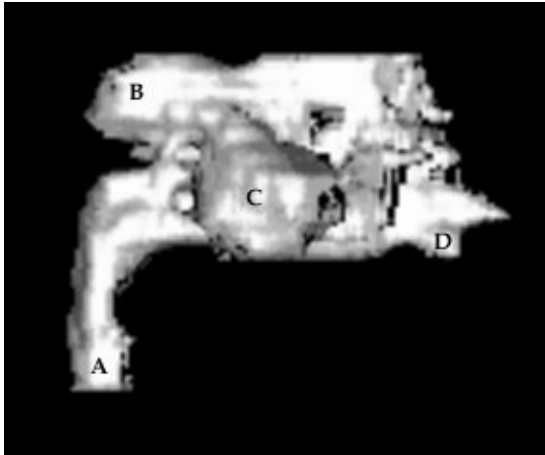
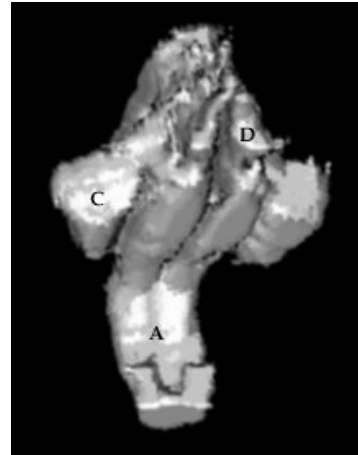


Figure 5: MR-based nasal tract reconstructions of adult male



Nasal tract - sagittal projection



Nasal tract - view from inferior

A = nasopharynx

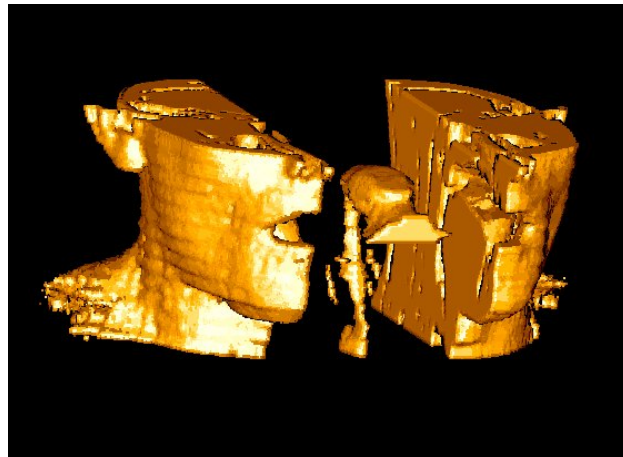
B = sphenoid sinus

C = maxillary sinus(es)

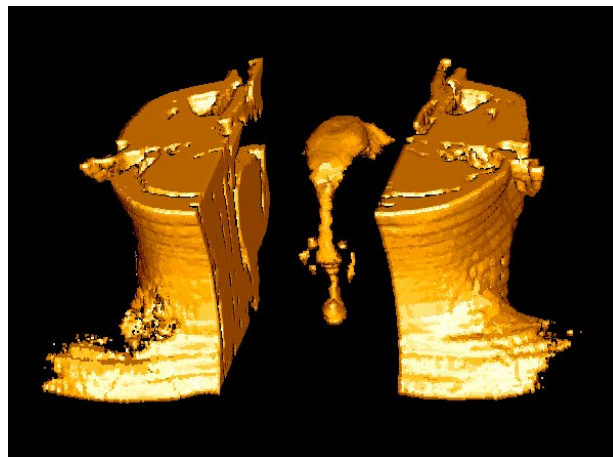
D = nares

The figures on this page show the head and neck tissue that was segmented to reveal the airway configuration the vowel /ɑ/ produced by the adult male talker. Note the image resolution is circa 1994.

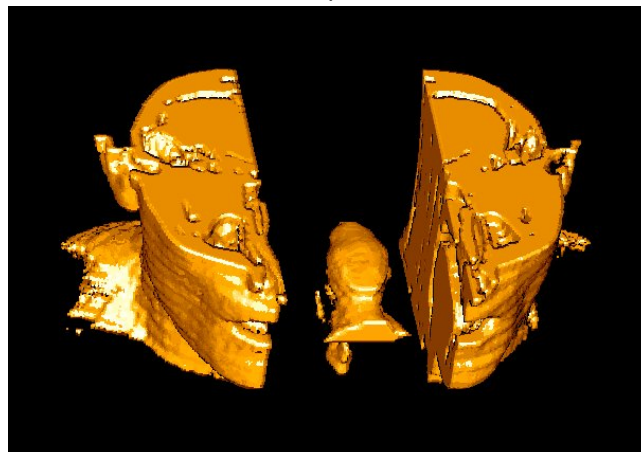
Figure 6: MR-based vocal tract reconstructions of adult male



Vocal tract - anterior view



Vocal tract - posterior view



Vocal tract - anterior/superior view

Figure 7: CT-based vocal tract reconstructions of the /a/ vowel

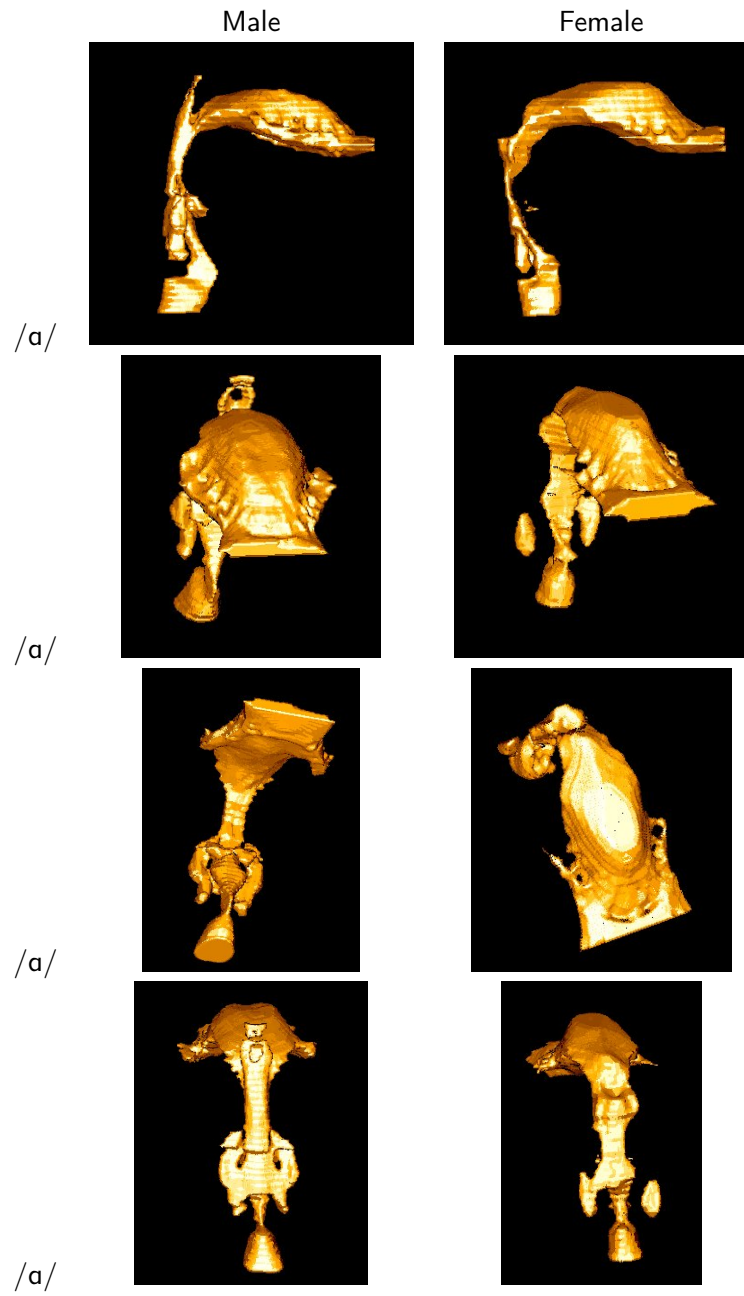


Figure 8: CT-based vocal tract reconstructions of the /i/ vowel

