



# VisArtico: a visualization tool for articulatory data

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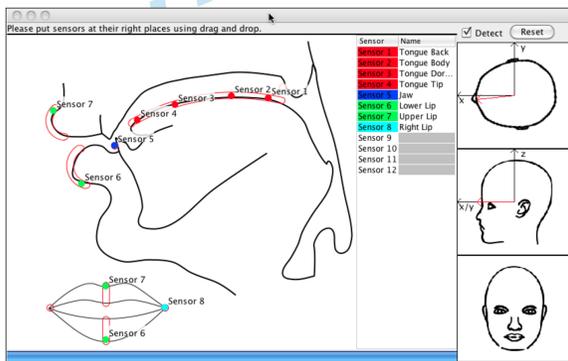
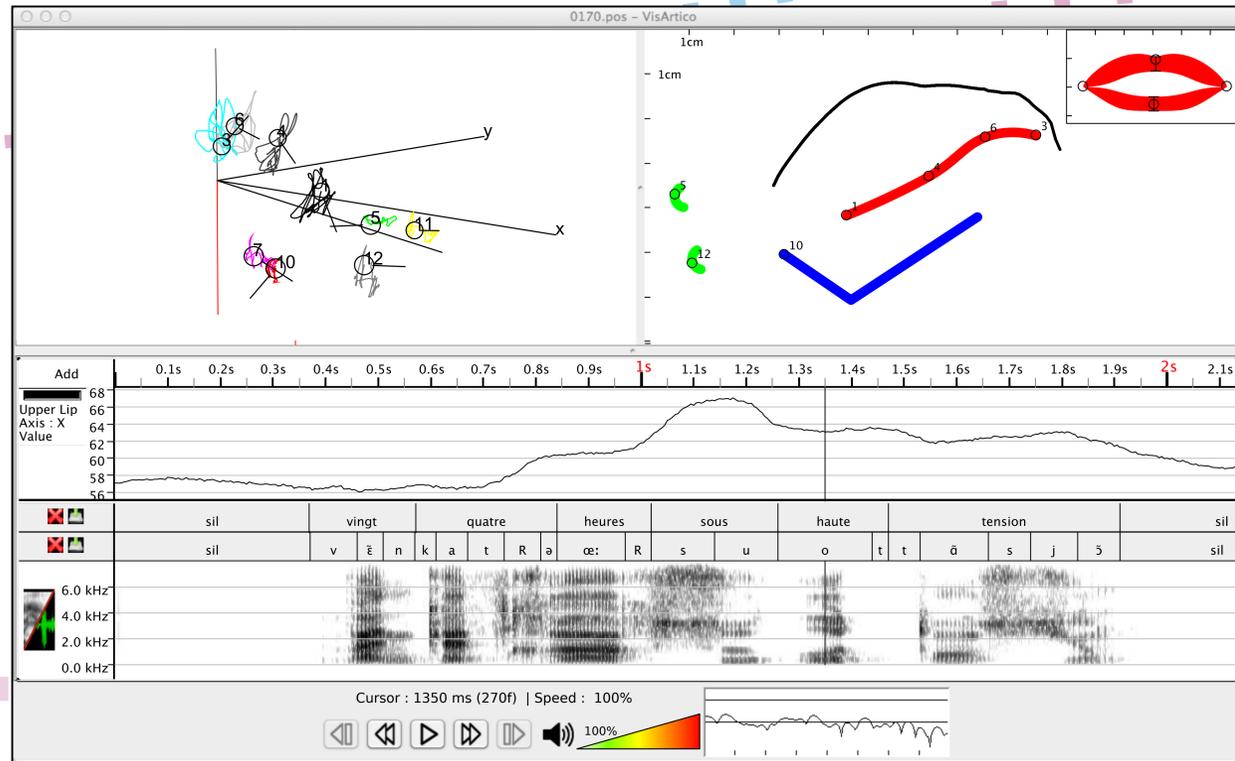
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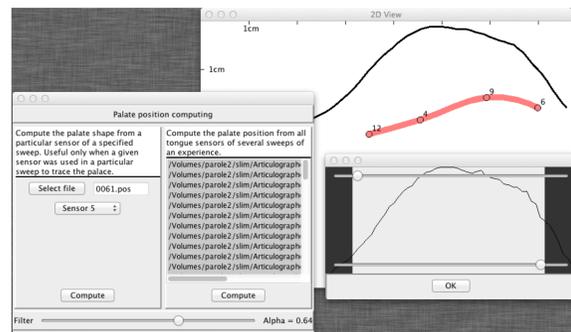
## Abstract

VisArtico is a visualization software for articulatory data acquired by an articulograph of one of the two main brands: **Carstens** and **NDI**. The software allows displaying the positions of EMA sensors whose motion is simultaneously played back with the speech signal. It is possible to display the tongue contour and the lips contour. The software helps to find the midsagittal plane of the speaker and find the palate contour. In addition, VisArtico facilitates (phonetic) labeling of the articulatory data. Our main goal is to provide an efficient tool to visualize articulatory data for researchers working in the speech production field.



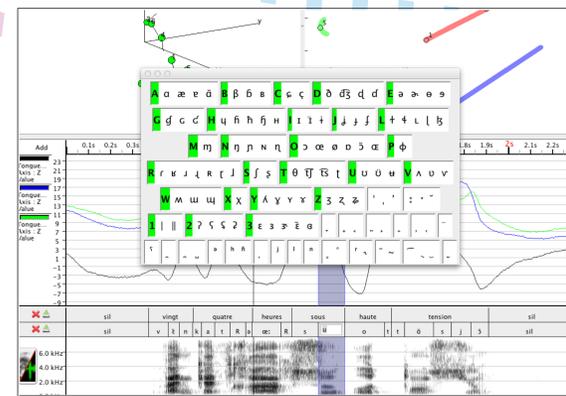
## Articulatory Configuration

- ▶ The configuration tool helps set up the association between sensors and articulators.
- ▶ The shape of the jaw is an approximation.
- ▶ The tongue contour is approximated by connecting the sensors of the tongue, using lines or a spline curve.
- ▶ The shape of the lips can be determined from two or up to four sensors.
- ▶ The configuration tool is used to determine the speaker's midsagittal plane.



## Palate Contour Detection

- ▶ Visualizing the palate allows a better interpretation of the tongue movement.
- ▶ VisArtico can use a palate trace sweep to extract the contour of the palate.
- ▶ If that information is unavailable, VisArtico can calculate an approximation of the palate contour using an efficient algorithm.
- ▶ This algorithm predicts the palate contour from the positions of the tongue sensors.

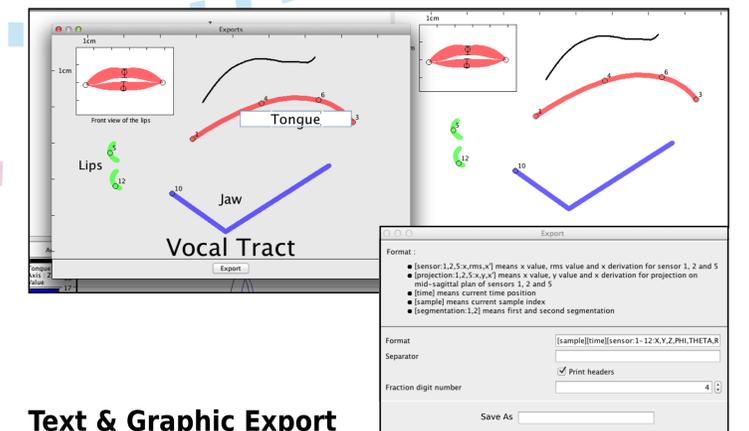


## Phonetic Labeling

- ▶ VisArtico allows labeling the articulatory data.
- ▶ Labeling can be done directly within VisArtico, or by importing one or more label files created by other software (Winsnoori, Praat, etc.)
- ▶ Currently supported formats: **TextGrid**, **xlab**, **ali**, **seg**.

## Main Features

- ▶ Support for Carstens and NDI articulographs (**AG500**, **AG501**, and **NDI Wave**).
- ▶ Visualizing the **tongue shape**, the **lips**, the **jaw**, and the **palate**.
- ▶ Providing several possible views: **temporal view**, **2D midsagittal view**, and **3D spatial view**
- ▶ Animating and playing the **three views synchronously** with **audio** and in **realtime**.
- ▶ Displaying different articulatory trajectories in addition to the acoustic signal (waveform/spectrogram) and any phonetic labels.
- ▶ Displaying **derivatives** of given trajectories.
- ▶ Providing meaningful articulatory information.
- ▶ Displaying multi-level annotations.
- ▶ Creating segmentation files. User friendly input method with support for phonetic symbols.
- ▶ Improving the quality of the data by providing tools to filter out some outliers (**low-pass filter**, **RMS cutoff**).
- ▶ **Exporting 2D & 3D Views into Encapsulated Postscript (EPS) format.**



## Text & Graphic Export

- ▶ VisArtico allows exporting the 2D and 3D views in a scalable format (EPS).
- ▶ Titles and labels can be added with different font sizes.
- ▶ It is possible to export any part of the original or processed data for further analysis with external scripts or other software.
- ▶ For text/spreadsheet export, the format is highly customizable, and labels can be embedded along with EMA data frames.



VisArtico can be freely downloaded from <http://visartico.loria.fr/>

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