

**« MATCH YOUR OWN VOICE! »**  
**A SOFTWARE TOOL TO ASSIST SINGING PRACTICE ON THE**  
**SOMATOSENSORY MOTIVATION**

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Many students report that after a successful voice lesson with their teacher/coach they experience a tremendous difficulty repeating the same technique when they practice on their own. They claim that they cannot recall the exact position of the respiration, vocal tract or muscle activities taught, and thus base their practice solely on the subjective basis of their auditory perception of their own voice.

Recent fMRI studies have confirmed that Opera singers tend to control their voice by depending largely on their somatosensory, rather than auditory feedback of their voice. They have learned how to control their bodies in order to achieve their optimum sound. But how can everyone achieve this? Is there a way to quantify and repeat, what our teacher suggests as our current best result?

In this paper we will **A)** refer to software-based practices which help students to ameliorate their quality of voice, **B)** demonstrate the architecture behind the basic version of a new software tool designed to assist students study more efficiently, and **C)** case study two singers who practice the same song using the instructions of their teacher, before and after the use of this software.

We follow 3 distinct stages: **1)** During the singing lesson the teacher defines the best quality of voice the student can achieve and builds the student's reference sound library. **2)** The program performs an FFT analysis and stores the values for the harmonic peaks of the student's reference sounds. **3)** Subsequently, when the same student is practicing, the program will analyze each real-time sound and compare to its harmonic content to the respective stored sound in order to give the student a real-time visual representation of the proximity to the reference. **4)** During the vocal progression of the student, stage 1 can be repeated in order to include a recent set of reference sounds which can now be achieved.

This way, students don't have to rely on their perception during the lesson and they can try various changes in the muscle and vocal cavity positions in order to affect her/his voice according their teacher's suggestions. Subsequently, students can repeat over and over sounds closer to the voice quality indicated by the teacher, in order to develop a new "muscle memory" for the respiration, vocal cavity position and articulation according to their somatosensory motivation.