

WORKSHOP: USING THE VOCAL TRACT ORGAN TO ENHANCE UNDERSTANDING OF VOICE ACOUSTICS.

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Abstract

The Vocal Tract Organ was originally developed for a special after-dinner flash-mob opera performance in front of royalty. Since then, it has been used for the performance of specially composed music on various occasions. This workshop will present the instrument and describe its principles of operation with a view to enhancing understanding of the acoustics of speech and singing voice production. The organ consists of 3-D printed vocal tracts for different vowels that sit atop a loudspeaker that produces a larynx output that is synthesised using Pure data, or Pd. The larynx output can be adjusted in many ways including its waveform shape (directly in the time domain), its fundamental frequency (for choral singing different tuning systems can be demonstrated) and vibrato (rate and depth). It also offers a unique way to demonstrate that the vocal system is, at least to a first approximation, a linear system. The underlying acoustics of the vocal system will be explored by making use of the Vocal tract Organ as the demonstration tool.