BIONIC PITCH BENDERS FOR FREE REED INSTRUMENTS

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ABSTRACT

3D printed vocal tracts modelled from MRI scans of an expert musician performing note bends on a diatonic harmonica are shown to precisely reproduce the same pitch changes. The geometry of the vocal tract acoustically coupled to the reeds is now investigated as an exterior replica or even used as a prosthetic to demonstrate a difficult musical technique. This process is discussed within the history of vocal tract models, and interrogated through a critique of Norbert Wiener's contentious claim that 'the best material model for a cat, is another cat, or preferrably the same cat'. We finish with a discussion of how this tool chain of magnetic resonance imaging and numerically controlled fabrication affords novel research in performance techniques through physical simulation.