Resonance Improviser: A system for transmitting the embodied sensations of vocalization between two people during improvisation

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ABSTRACT

This is a system prototype for joint vocal improvisation between two people that involves sharing embodied sensations of vocal production. This is accomplished by using actuators that excite two participants' rib cages with each other's voices, turning a person's body into a loud speaker. A mircophone transmits vocal signals and the players are given a Max Patch to modulate the sound and feel of their voice. The receiver hears the other person's speech and effects through their own body (as if it were their own voice), while also feeling the resonance of the sound signal as it would resonate in the chest cavity of the other. The two players try to re-enact and improvise a script prompt provided to them while not knowing what the other person can hear, of their voice. The game may or may not turn collaborative, adversarial, or artistic depending on the game play.

1. INTRODUCTION

In this paper, we present the proof of concept for the Improvised Resonator, sketching its architecture, design, user experience, and the experimental methodology that will be used to evaluate the effects of the experience for the context of this demo.

1.1 Background Work

The Resonance Improviser an example of an Augmented Social Embodiment (ASE) system. ASE combines features of sensory augmentation devices [1] with social embodiment [2] to use new sensor and wearable technologies to transmit and share aspects of our embodiment that cannot normally be shared. For example, by using haptic communication devices we can remotely transmit information about one person's muscle movements while performing a task to the associated muscles and joints of another person [3]. Using sensor technologies to enrich social interactions is related to projects such as "enriched social interactions [4], "mediated intimacy [5], "co-embodied technology" [6], "interpersonal biofeedback" [7], and "phatic technologies [8]. Specifically, these related projects embed wearable technologies in social interactions with the goal to enhance those interactions. However, very few of these projects use sensory augmentation wearable devices to transmit information about another person's embodied state. Many of these previous related projects represent information about another person in a very symbolic, abstract way. Instead, the Resonance Improviser directly transmits vibrations of the vocal cavity from one person to another.

1.2 User Experience

The users will be instructed to go to opposite corners of the room, facing away from one another, and looking up to follow a script that will be presented on a screen. Each player will also receive a screen to control a Max Patch to modulate their voice, with noise and glitch effects that the player themselves will not be able to experience before sending them to their partner. We adapted a script of human-computer interactions from Stanford University's colorful personality chatbot transcripts, with one player taking the human role and the other taking the computer role.

1.3 Hardware Setup

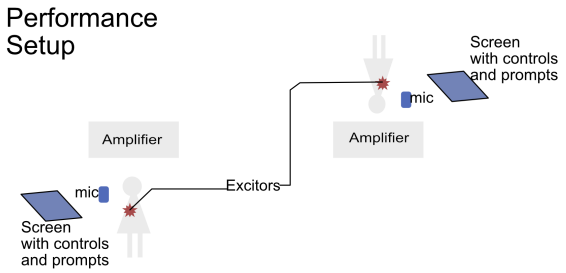

Figure 1. Schematic diagram of demo setup. The two participants, separated from each other take part in vocal improvisation, while wearing excitators that communicate their

Each participant can influence the way their voice will be heard and felt by their partner by adding various audio effects. they will transmit their voice with these audio effects to their partner's rib cavity without hearing their voice modulated by the effects for themselves.

The idea of this project is to create a disembodied voice installation through actuating two participants's rib cages with each others's voices. Two speakers in this interface

act as resonating bodies producing each others voices. The two players are encouraged to play with loopers, vocoders, sampling and glitch to speak with/through each other, while they dont receive feedback about how their own production sounds. They also hear the other persons voice through their own rib cage cavity. This project allows users to transmit from one person to another an aspect of the inner embodied sensations created by vocal vibrations in the chest cavity. Using an actuator device, users can feel vibrotactile sensations on their own sternum and ribcage recorded from anothers body while listening to this other person speak (and/or sing?).

2. CONCLUSIONS

This creates a novel experiential context wherein which something which is normally an intimate part of our social embodiment, our voice, is suddenly shared. Exciting your own rib cavity using someone else's voice is a body transfer experience. We are familiar with the corporeality and feel of our own voice and its inevitable resonance while breathing, speaking, singing, etc., and this makes experiencing another person's voice as vibration in your body an intimate experience. In essence, they hear the other person's voice in a way that they only ever hear their own voice and we are making interpersonal something which is normally intrapersonal. Embedding physiological sensors and biofeedback in social interactions has been shown to enhance interpersonal connections and intimacy among strangers (Bala et al., 2004; Vetere et al., 2005, Gibs et al., 2005). In a 2014 review of strategies that designers can use to create technologies to foster interpersonal connection, Hassenzahl and colleagues suggest joint action as an effective strategy. Thus, we implemented joint vocal improvisation in our design.

3. REFERENCES

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