The Stickatron and the Elastiphone: Two entangled musical instruments.

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Abstract— **This document presents two novel shared music making instruments that are influenced by concepts derived from an enactive account of social interaction and posthuman discourse, to facilitate the emergence of an increased sense of intimacy between players.**

Index Terms— entanglement, embodied, multi-player, mutual, participatory sense-making

I. Introduction

Emerging research in the field of digital musical instruments (DMIs) has drawn on entanglement ideas from posthumanism as a way to discuss areas such as open mixer feedback musicianship [1, 2] and human-AI musical creativity [3]. Such research extends DMI research by moving from the idea of 'playing', as in controlling an instrument, to an experience where the human player and the system mutually engage. Little research, however, has considered applying entanglement to two or more players collaborating within a singe musical system.

The two presented projects are part of a wider practice of applying post-human ideas of entanglement [4] and apparatus [5], alongside participatory sense-making ([6]) to shared musical experiences. The study explores how such instruments can enable enjoyable, embodied entanglements and intimate connections between people as they play[1].

II. Related multi-player works

We can see elements of such a paradigm appearing in several existing multi-player projects. Such as SensorBand's SoundNet [7], where a network of interconnected climbing ropes (mapped and sonified via tension sensors), enmesh players' individual movements. While Fels directly couples players with the Tooka [8]; here a constant input of air from two participants onto a shared pressure sensor ensures that any sound is co-produced. TONETABLE [9] entangles individual contribution by creating an interactive environment facilitated through a fluid dynamics simulation. Players don't interact directly but through affecting the simulated water.

III. Playing the Stickatron and Elastiphone

The Stickatron is played by players holding one handle each of the interface and, together, they lift then move the stick in space to explore a synthesised world. Pitch (vertical angle) and yaw (horizontal rotation) both have an effect, while the position of the stick's mid-point in the instrument space (a 1.5m sided cube centered on the sensing GameTrak) acts as a '3 dimensional playing cursor'.

The Elastiphone replaces control of the synthesis system with a virtual elastic band between the players hands. The same data is extracted as for the Stickatron, but with the addition of the separation between the players' hands.

IV. Early results

The following observations are presented for discussion, given the research is on-going. A physical coupling between the players reduces individual autonomy but more easily encourages shared agency to emerge. Actively maintaining a specific stance allows for one player to gift their co-player a period of increased autonomy but with constrained agency. Mutual awareness and observation is essential for multi-agent entanglement; it can feel lonely, holding one end of the stick, without sensing any co-player contingent response.

V. References

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