Distributing Synthesis Across Audience's Phones

Background Information

For those who are unfamiliar with the contemporary field of computer music, perhaps the most efficient way to understand the proposed research project, which seeks to instantiate *distributed synthesis* as a creative practice that draws from, and contributes to, the fields of music, art, technology, and education; might be to understand how *live coding*, the creative practice of writing code "on-the-fly" as a form of expressive musical performance, (Collins et al. 2003; Wang and Cook 2017) implicitly functions as a *boundary object* (Loveless 2019) capable of doing exactly each of these things.

As a musical practice, *live coding* invites practitioners to interface with the computational and transducing capacities of some technological assemblage (in most cases - a computer and a public address system) via the affordances of a text-based computer language, as written and executed from within some form of integrated development environment. Here we can see *live coding* draw from the conventions of electronic music performance and algorithmic music composition, and contribute a repertoire fabricated largely from materials brokered from an adjacent community of practice - the field of computer programming. From the perspective of education, *live coding* paves a way into computer science - providing a form of cultural visibility for programming practices, capable of igniting and sustaining students' intrinsic motivation to study.

In each case, the appearance of *live coding* within the discipline poses some threat to the presiding primeval sense of correctness - an agitation that produces a set of tensions that require some amount of intra-disciplinary discourse to explicate. Once a vocabulary has been generated that can attend to the central problematics of the practice in this new context, what was initially an uncanny boundary object then becomes more wholly intelligible within the field. Because of this defamiliarising, transversal function, we might usefully understand *live coding* as bearing some affinity with the emergence of work in contemporary art that deals with post-relational, ecological aesthetics.

It is in these ways, that the project of *distributed synthesis* wishes to follow in the footsteps of *live coding*, but with some important differences. While both projects broker repertoire from the field of computer programming, in *distributed synthesis*, the technological assemblages being interfaced with are sets of smartphones (or other personal devices), which immediately presents a different set of non-trivial problems and opportunities, not least of which being how to harness the computational and transducing capacities of smartphones, and *how to connect them together.

This research investigates the creative and theoretical ramifications of using the internet browser to interface with phones' technological affordances, and of using internet communication protocols to solve the problem of connection. As such, unlike *live coding*, the brand of *distributed synthesis* advocated for in

this research draws a significant portion of its technical knowledge from those communities of practice whose domain is *web development*, a move that comes with its own set of implications and agitations, both for computer music, and web development.

There is an important sense in which *distributed synthesis* might be an even more ambitious undertaking than *live coding*, which has to do with what it is asking from audience members. Although *live-coding* may be stylistically challenging, with performances tending to be long-form, meandering, metronomic, repetative, etc., the material coordinates of the music performance ritual are largely unchanged. With *distributed synthesis*, however, even before the *stylistic* constraints necessitated by the limitations of the technological assemblage become a factor, a different set of problems and opportunities, which arise in relation to what material coordinates constitute the music performance ritual in the first place, must be grappled with. The problematics around assembly and ritual arise in relation to this fundamental agitation - that, if, *conceptually*, we are to coalesce our phones into one conglomerated musical instrument, what ought we to do with our phones, *physically*?

Finally, we might note that the compositional problematics of *live coding*, which must scaffold for the limitations of a purely text-based performance interface, differ substantially from those of *distributed synthesis*, for which the performance interface is a lot more open-ended, and for which the central compositional problematics instead focus on how to scaffold for the limitations in timing necessitated by latencies in client / server / database communications; and how to best make use of the potential for massive polyphony uniquely present in *distributed synthesis*.

Research Questions

Rationale

Skills Required

Collins, Nick, Alex McLean, Julian Rohrhuber, and Adrian Ward. 2003. "Live Coding in Laptop Performance." *Organised Sound* 8 (3): 321–30. https://www.proquest.com/docview/215098471/abstract/270E6D81CD440A6PQ/1.

Loveless, Natalie. 2019. *How to Make Art at the End of the World: A Manifesto for Research-Creation*. Durham: Duke University Press.

Wang, Ge, and Perry R. Cook. 2017. "2004: On-the-Fly Programming: Using Code as an Expressive Musical Instrument." In *A NIME Reader: Fifteen Years of New Interfaces for Musical Expression*, edited by Alexander Refsum Jensenius and Michael J. Lyons, 193–210. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-47214-0_13.