RESEARCH STATEMENT

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Introduction

Technology has matured quickly since computer music centers began opening their doors in Europe and the Americas. Music research can suffer when faced with pressure to adapt its practices to the needs of technology; likewise, innovation becomes difficult when technology is used in support of existing musical practices. Further, collaborations between music and other disciplines can suffer when the needs of one are felt to subjugate the needs of the other(s). This is particularly true of music and technology collaborations, but just as true, if more normalized, of more traditional collaborations such as music and dance.

Music technology is an inherently collaborative, practice based area of research, and questions of how to collaborate with humans and machines within and across disciplines must continue to be brought center stage. Specifically, we must begin to better understand how to engage in collaborative practices that are grounded in difference, heterogeneity, and incommensurability without sacrificing those areas of practice we hold most dear.

The areas of my practice-based research that I describe below—media/arts programming, polytemporal composition, and critical appropriation as a catalyst for interdisciplinary collaboration—are entangled and inseparable within my approach to creation, publication, and pedagogy.

Speculative Media/Arts Programming

Much of what we do in media/arts programming is speculative in nature. We may begin a project with little or no idea of how to proceed, or even what the goals are. We work in environments that are fundamentally different than those in which our work will be presented. This exploratory process is often interrupted by the need to transition to a performance-ready, i.e. stable and robust, version of the software. This transition can be a costly one: it takes time, it can be error-prone, it is disruptive to fragile ideas in the making, and reorganization erases important traces of the evolution of the creative process. Media/arts programmers and practitioners would benefit from being able to push the creative, exploratory process as deep into the process of preparing for a concert as possible, however, the challenge of building a system that is at once sufficiently robust enough for performance and flexible enough to support full creative exploration is a burden not many can bear.

While working at CNMAT, I co-designed and was the primary implementer and maintainer of **odot**, a dynamic, multiparadigm programming environment [1,2,3,4,5,6,7,8]. Odot served, and continues to serve, a variety of important purposes. As a platform for practice based research and experimentation, we were able to show that access to programming paradigms unavailable in traditional media authoring environments such as Max/MSP could benefit media/arts practices [1,2,3,4,5]. As a technology probe, odot has been invaluable to help us reflect on the complex and understudied practice of media/arts programming. As a system designed to exist in and support heterogeneous environments, we have shown the benefits of having a common data structure and evaluator to communicate between processes and applications [2,6,7]. As a robust and efficient tool used in numerous compositional environments, performances, and installations. Odot has since become an integral component of the music technology curriculum in the Department of Music at UC Berkeley.

Temporality

Underlying much of my thinking about human-human and human-machine collaborations are questions about time and temporality. For many years now, I have been developing tools to support the composition and performance of polytemporal music, i.e., music in which the tempos of different parts vary smoothly over time, independent of one another. **timewarp**~, a graphical tool for Max/MSP for both composition and performance [10, 11], has formed the basis of much of my recent compositional work, as well as a number of works by Edmund Campion. In *aberration* and *Delicate Texture of Time*, I explore machinic time—a species of time produced by and unique to machines—as a compositional intervention. The performers listen to click-tracks that help them to align their temporalities with that of the computer. *Hyphos* and *Limn*, are exercises in the differentiation of human-musical and machine time. The performers learn the pieces with click tracks, and then perform without them—an impossible task intended as a *diffractive* act, to borrow Karen Barad and Donna Haraway's metaphor, to produce a situated temporality neither human nor machinic and yet both human and machinic.

Critical Appropriation

The notion of "critical appropriation" [12] is a provocation to consider a given piece of technology, whether it be hardware, software, a concept or an idea, as multiple and relative to a given frame of reference. It is a provocation to consider the traces of the value systems left by its design and their impact on use. It is central to my collaboration with choreographer Teoma Naccarato in which we apply it to biosensors, specifically wireless electrocardiograms (ECGs—heart rate monitors), as an intervention in music and dance practice and performance. In this deeply interdisciplinary work, which comprises many performances, installations, workshops, and publications [9, 12, 13, 14, 15],[1] we conceptualize the signals from the ECGs as consisting of events that exist in a temporality foreign to both music and dance. We resist the temptation to subjugate one of these temporalities to another— musicians are not asked to sacrifice their sense of musical temporality in order to "follow" the heart beat of a dancer. Rather, the process of composing pieces in this project involves the gradual and collaborative process of bringing awareness to one's sense of musical time through its juxtaposition with the temporality of a transduced biological process. We endeavor to construct a subjective, performative temporality through collective practice that is rooted in difference and incommensurability.

To this end, we have developed a somatic practice called **Relational Listening** that we have taught at a number of workshops in Europe, Canada, and the U.S. We used this practice to develop basic material and train our cast during the month-long creation process of *III:tangente*, a large-scale work for three musicians, three dancers, and three breathers.

Finally, with *III:respire*, Naccarato and I return to the machinic time of *aberration* and *Delicate Texture of Time*, but here, the click-tracks guide the tempo of three performers' inhales and exhales producing accelerations and decelerations in their heart rate that create a human reproduction of the machinic temporal arcs. Metaphorically, the three performers "transduce" machinic time into cardiac time.

Conclusion

Music technology is inherently collaborative, and I believe the questions that shape its future lie in the increasingly heterogeneous nature of those collaborations. Centers and departments in academic institutions have an important role to play in providing places where intra- and interdisciplinary collaborations, human-human and human-machine, can take place and be taught, leading away from disciplinary stagnation towards æsthetic innovation.

[1] This list of publications does not include a number of articles currently in the submission process, which are available upon request.

References

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