Addressing NIME’s Prevailing Sociotechnical, Political, and Epistemological Exigencies

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Abstract: Nearly two decades after its inception as a workshop at the Association for Computing Machinery Conference on Human Factors in Computing Systems, New Interfaces for Musical Expression (NIME) exists as an established international conference significantly distinct from its precursor. Although this origin story is often noted, the implications of NIME’s history as emerging from a field predominantly dealing with human–computer interaction (HCI) have rarely been discussed. In this paper we highlight many of the recent—and some not so recent—challenges that have been brought upon the NIME community as it attempts to maintain and expand its identity as a platform for multidisciplinary research into HCI, interface design, and electronic and computer music. We discuss the relationship between the market demands of the neoliberal university—which have underpinned academia’s drive for innovation—and the quantification and economization of research performance that have facilitated certain disciplinary and social frictions to emerge within NIME-related research and practice. Drawing on work that engages with feminist theory and cultural studies, we suggest that critical reflection and, moreover, mediation is necessary to address burgeoning concerns that have been raised within the NIME discourse in relation to methodological approaches, “equity, diversity, and inclusion,” “accessibility,” and the fostering of “rigorous” interdisciplinary research.

Introduction

The International Conference on New Interfaces for Musical Expression (NIME) appeared for its 20th incarnation in the summer of 2020. At this milestone, we wish to take a moment to draw attention to a variety of interrelated themes that have reached a crisis point within the conference discourse. We see these as exigencies requiring not only critical reflection but also urgent mediation, given that many of the prevailing concerns have been voiced by NIME participants and those from its adjacent communities for many years. Specifically, we will discuss the relationships between prevailing sociopolitical and epistemological struggles within the field through the “planar” framework set out by Georgina Born.

Born’s model interrogates the ways in which multiple temporalities and social planes are at play within historical analyses of musical institutions and their surrounding discourses, and how cultural eras are shaped by these (Born 2010a). While our tone may appear less than optimistic, we believe that in drawing awareness to these structural forces to demonstrate how “powerful discourses or metaphors come to structure musical experiences . . . conditioning the future musical expressions” (Born 2005, p. 14), there will emerge bountiful opportunities to enrich and transform the field. Whether these potentials become actualized will depend, of course, on the organizational capacities and actions of the communities that constitute NIME itself.

Declaration of Affiliation

In this work, we draw analyses not only from what has been documented in the NIME proceedings and the adjacent literature, but also through our lived experiences as participants in the conference. We have been involved with the NIME field in a variety of roles since 2011 and 2010, respectively.
We have participated over the years as authors, coauthors, performers, workshop participants, reviewers, and as part of the Program Committee—the small group of volunteers who oversee and help coordinate the peer-review process for paper submissions. Between us, we have attended NIME 13 times, and presented our work 15 times as a combination of papers, posters, and performances. We have both contributed to the first NIME reader (Jensenius and Lyons 2017), a collection of works intended to represent a chronological anthology of the field’s activities—at least, that is, its activities as captured within its literary scholarship. We have attended and spoken out at NIME “townhalls”—the gathering of conference attendees that is typically held towards the end of the conference in which thoughts, reflections, and concerns can be aired. We have taught NIME-related courses at universities in North America, Latin America, and the United Kingdom, and we view certain aspects of the NIME discourse as being foundational in our research and practice. We must acknowledge from the outset that our research agendas do not happily align with the dominant narratives that have been reified and reproduced over the course of our engagement with the field.

We observe the broad community emerging from the NIME conference to be extensively heterogeneous in spite of sharing a common interest. This diversity, although having been celebrated since the conference began, does create a problem of a shared perspective and understanding among different interest groups (Marquez-Borbon and Stapleton 2017). We do not suggest that consensus is, or should be, the goal, but rather we wish to examine the hierarchies that are produced through this difference. Overlaps of varying degrees exist between affiliated subdisciplines, conference communities, and academic fields. As such, we refer to “the NIME community” and “NIME research” in the broadest possible senses throughout, allowing for the inclusion of those who may have faced barriers to attend or participate in the conference itself. This research and labor extends well beyond the conference proceedings. For example, a half-day panel on issues of gender that was held during NIME 2014 at Goldsmiths, University of London, led to numerous position papers being expounded within a special issue of Contemporary Music Review [see Born and Devine 2016].

We also will use the acronym hesitantly to refer to the conference proper, along with its associated research and practice, but wish to stress that NIME may suffer from the same existential issues as those applied to music technology as a field of study in Carola Boehm’s article on “the discipline that never was” (Boehm 2007, p. 7). For Boehm, the meaning of the term itself is highly dependent on the context in which it is used and where and how it is used:

The multiplicity of what exactly is understood by “music technology” is an indication of the fragmentation of communities at large and their emerging cultural boundaries, be it sound engineering, electroacoustic music, music informatics, or music education technology (Boehm 2007, p. 7).

We are similarly reluctant to encourage the normalization of NIME as a noun, often observed to be used interchangeably with digital musical instrument (DMI). These formulations both center and simultaneously exclude particular themes—notably the embodied and the social aspects of musical activity in the latter case. In attempting to define what, for example, a DMI might include or exclude—how to deal with analog–acoustic hybrids, for example—we give our attention to a rather narrow technical discussion. Imagined archetypal “NIMEs,” we would hazard, would generally omit the wealth of possibilities that have been configured in practice, and at NIME over the years.

Tracing the N, I, M, and E

The historical present in electronic music and sound cultures is full of contradiction (Rodgers 2015, p. 79).

The very words of New Interfaces for Musical Expression have been contested and explicated individually within the NIME literature. See, for example, Gurevich and Treviño’s case for an approach that favors thinking from the perspective of

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“ecologies” over “expression,” which understands the relationships between composers, performers and listeners as part of a system that includes external factors such as genre, historical reception, sonic context, and performance scenario” (Gurevich and Treviño 2007, p. 108). The “newness”—extending into a favoring of novelty—has been pointed out as similarly problematic, most often in relation to the persistence or longevity of DMIs (see Freed, MacCallum, and Mansfield 2013; Marquez-Borbon and Martinez Avila 2018). As author Hayes noted during the presentation of this exposition at NIME 2020, her own instrument is now thirteen years old, hardly a NIME—perhaps more of an “OIME”—yet it continuously evolves through spurts of development and periods of stasis (see, for example, Hayes 2012). Although the persisting significance of the “N” in NIME may not have been given much thought when the first NIME workshop was put together, we unquestionably have plenty to learn from the practices of those using such “old” interfaces for musical expression, even those that may be deliberately elusive, resist over-categorization, and exist purposely as ecologies rather than rigidly bounded or identifiable objects. Ann Light’s work on queer theory and human–computer interaction (HCI) points out the importance of promoting design that is “space-ful, oblique and occasionally mischievous” (Light 2011, p. 431). Regarding longitudinal accounts, two recent interview-style papers from NIME 2020 are promising. In the first, the machine-learning expert Rebecca Fiebrink and the performer and instrument builder Laetitia Sonami discuss the latter’s eight-year development of her latest instrument using machine learning (Fiebrink and Sonami 2020). For the second, Tom Davis, here deliberately assuming the strict role of instrument designer, and Laura Reid, cellist, explore collaboration beyond technical development or study of user experience through a qualitative, semistructured interview approach (Davis and Reid 2020).

Turning to the “M”: while the “musical” may be assumed, “musicality” is often used as a throwaway term within NIME literature. As Owen Green (2012, p. 1) hints, there is even work to be done here: “To engage with questions of musicality is to invite into consideration a complex network of topics beyond the mechanics of soundful interaction with our interfaces.” We ourselves appropriated the four letters of the acronym for the title our paper presented at NIME 2020 [Hayes and Marquez-Borbon 2020, an earlier version of this article], addressing its “Nuanced and Interrelated Mediations and Exigencies.”

It is the I of “interfaces” that Michael Gurevich (2016) suggests is often invoked to cement NIME as a field that is historically rooted in the musical inventions from around the turn of the 20th century. This “audio-technical” (Rodgers 2010, p. 3) framing centers the transduction of environmental changes into electrical, and then acoustic, signals. The design of, and subsequent engagement with, technical systems or artefacts forms the basis of enquiry. Gurevich also traces an alternative history that is woven through the practices and theoretical writings of what appears to be predominantly male Euro-American composers and experimentalists (we note that BBC Radiophonic Workshop cofounder, Daphne Oram, is also included in this short list). Gurevich suggests that this framing is more aligned with what would now constitute the methodologies of creative practice research (CPR). While technical reports from the International Computer Music Conference (ICMC) predate the first NIME workshop, explicit formal scientific writing about such new interfaces is generally seen to have emerged concurrently with the conference.

Arguably, the conference’s remit has expanded greatly from a focus on interactive interfaces and novel methods for controlling audio digital signal processing. The growing number of topics within the conference’s Call for Participation evidence this apparent increase, with the eight listed in NIME 2001 growing to twenty-six in 2020 (see https://www.nime.org/past-nimes). Although the first few years of the conference saw a fairly continuous growth in participation, the stabilization in conference attendee numbers that has followed has not been accompanied by epistemological clarity within the research (Gurevich 2016). Observations from within the community itself bemoan NIME as an “artifact-centered field of research” (Elblaus, Hansen, and Bresin 2014, p. 1), where the discourse has “tended to focus on implementation issues—with some coverage of performance—but
with very scant coverage of wider issues of practice” (Green 2016, p. 78). As Green notes, even where researchers have acknowledged the importance of musical performance practice as a site for evaluation, these studies tend to center on technical objects rather than wider questions of musicality (Green 2014). This comment refers to an emergent trend within NIME discourse to address the need to evaluate new instruments within a formal framework. This assumes that this kind of evaluation is a primary goal of the research.

Concurrently, we see an emergence of calls to the community to address the wider sociopolitical concerns associated with the field. In the title of her paper focusing on questions of representation and authorship, Anna Xambó (2018) asks, “Who Are the Women Authors in NIME?” Yet 15 years earlier, drawing on feminist theory and science and technology studies, Georg Essl’s (2003, p. 26) summons to the NIME community provided an emphatic critique of a discourse that was almost exclusively “gender unaware.” And although the discourse may be lacking, the community is generally self-aware of issues related to representation and diversity, NIME being, as Jensenius and Lyons (2016, p. 3) wrote 13 years after Essl’s commentary, “still male-dominated.” We also wonder, here, when the white dominance within NIME will be formally acknowledged and discussed. Recent calls to increase the numbers and visibility of women in NIME (see Reid, Sithi-Amnuai, and Kapur 2018; Xambó 2018) are generally situated within discussions of representation. As Annie Goh (2014) notes, perhaps the more-difficult task lies in tackling those power structures related to gender and technology that move beyond speaking in terms of a gender binary, and that deal with deep-seated biases, myths, narratives, and discourses. Indeed, adjacent topics from feminist science and technology studies—including the relationship between technology and gender construction—were also proposed in Essl’s paper.

In 2018, the NIME Steering Committee announced a new conference Diversity Statement [https://www.nime.org/diversity] and Code of Conduct [https://www.nime.org/code-of-conduct]. The former states that one of the goals of NIME is to foster an inclusive environment that invites “participation from people of all ethnicities, genders, ages, abilities, religions, and sexual orientations.” This follows moves within the Association for Computing Machinery (ACM) Special Interest Group on Computer-Human Interaction (SIGCHI) that encourage such statements to be posted on conference websites (see the “Advice for Organizers” at https://sigchi.org/conferences/organizer-resources), a practice that started appearing in the SIGCHI academic conferences around 2016. The 2020 NIME conference—which took place online—foregrounded the theme of “accessibility”. Certainly the format of a virtual conference, along with proper access preparation, can allow for attendance from musicians and academics who generally function from home, or who are not able to access a conference physically. The 2020 conference utilized, for example, extensive closed captioning as well as hybrid question and answer sessions, allowing for questions to be asked and addressed immediately after the presentations, as well as asynchronously.

Yet, as Amble Skuse (2020, p. 4) notes, true participation for disabled musicians can look very different from approaches to accessible technology design that often attempt to “fix a problem perceived by the nondisabled community.” Here Skuse, whose work and creative practice is grounded in critical disability studies (see Meekosha and Shuttleworth 2009), invokes the social model of disability: the processes of being actively disabled by societal structures, or lack of infrastructures, over the commonly assumed medical model. This point also flags issues of participation more broadly, and the perpetuated dichotomy between “researchers” (inventors, engineers, designers, musicians, and so on) on the one hand, and “users” (imagined recipients of the technical objects) on the other. This very issue was identified within some of the research presented at NIME 2020, despite the theme of accessibility, which was interpreted widely by participants. Due to COVID-19, the conference was hosted virtually, technologically facilitated through a combination of Zoom, YouTube, and Slack. Perhaps given the real-time interaction that occurred between presenters and participants—where the post-paper presentation discourse was afforded some persistence through Slack’s threaded
messaging infrastructure—such problems could be more readily identified and discussed “publicly” by conference attendees.

Socialities, Temporalities, and NIME

The various issues that we raise here cannot be discussed in substantial depth and with due diligence in a single journal article. Instead, we offer an overview and synthesis of a now significantly substantial discourse. Certainly, we are conflating a host of issues that have been brought to the NIME community as distinct topics. Yet all of these may be addressed by examining the broader academic, sociopolitical, and historical currents that bind them together. In what follows we ask why, when the “discipline should be overcoming its initial growing pains” (Gurevich 2016, p. 80), it seems to have failed to do so. Although Gurevich’s question was specifically directed towards epistemological and methodological issues within NIME, we extend it here to the wider sociopolitical realms. We also wish to acknowledge that NIME 2020 took place during a global pandemic, with a variety of restrictions on freedom of movement in place around the world, and shortly after the killing of George Floyd by police in Minneapolis, Minnesota, which led to global protests in support of the Black Lives Matter movement—potentially the largest movement in the history of the United States (see, for instance, the report by Larry Buchanan on 3 July 2020 “Black Lives Matter May Be the Largest Movement in U.S. History” in the New York Times https://www.nytimes.com/interactive/2020/07/03/us/george-floyd-protests-crowd-size.html). Although the implications of COVID-19 for academia continue to be navigated through many different lenses, ranging from remote pedagogy to student rent strikes (see, for instance, Henry Lee’s 13 November 2020 report “Students at Manchester University Occupy Accommodation Block” on the World Socialist Web Site www.wsws.org), it is the very structural and persistent formations out of which the Black Lives Matter movement emerged several years ago that must also be disrupted in any efforts to make progress.

How does this relate to research involving music and technology? As Born, addressing the music information retrieval community notes:

Academic and scientific fields are just as likely to host these structural foundations as other areas of intellectual, cultural, and social life. They, too, are likely to be sites in which those inequalities, injustices, or biases made more palatable by the term “diversity” may become apparent and may require to be addressed. And if we think music is immune to such issues, then the recent furore that has arisen within the academic music theory community over accusations that it embodies and upholds a “white racial frame” should give pause for thought (Born 2020, pp. 193–194).

Elblaus and coauthors (2014, p. 1) have asked, “what activities are peripheral or external to the domain of NIME development, and is this demarcation made explicit by the researchers or is it implicit?” They suggest that if such boundaries have arisen fortuitously, it is important to interrogate the underlying objectives and motivations of NIME research. In stating our affiliation with NIME, we are positioning ourselves as participants within this discourse. Yet, as demonstrated in Born’s (1995) framework for understanding the multiple temporalities that are at play within the historical constructs of cultural institutions—which we expound subsequently—the “assessment of the degree of invention immanent in a particular cultural object . . . cannot be read off the protagonists’ discourse” (Born 2010b, p. 96). As such, we draw upon not only the official conference proceedings, but also from adjacent publications in related journals, various panels, and associated conferences. Furthermore, we underscore that the institutional “situatedness” of these platforms should not be the limiting case of NIME’s scope and community. Importantly, we attempt to situate this discussion beyond the “microsocialities” (Born 2010a, p. 234) of these domains, attending to a wider cultural and historical analysis.

Born’s (2010a) extensive project maps out musicological research as an interdisciplinary field, encompassing four topic areas: sociality, temporality, technology, and ontology. Promoting a relational
model, Born’s work aims to move beyond the subdisciplinary boundaries that have persisted within musical scholarship by challenging the assumed music/social opposition. As Green (2014) has noted, this framework can be applied to help develop new ways of addressing the complexities of the subdisciplinary areas within the context of NIME research. Specifically, this approach can help to trouble the commitment to binary understandings that separate the ways in which both music and social processes are mediated within NIME research and practice. Regarding sociality, for example, there has been extensive NIME research on the microsocialities of the first plane—that of musical activity, such as performing with an instrument—and on the second, with the various imagined public groups that engage in these activities, “laptop musicians” being one such example. This can often lead to reductionist accounts; for example, both authors perform with laptops but do not identify with this term, nor its related imagined community, nor its set of tropes regarding performance practice and gesture.

On the third plane, only a few clusters of activity within NIME have broached larger issues such as gender, as mentioned previously. Here we refer to not only the ensuing conversations regarding representation, but moreover the complex ways in which audio-technical discourses become gendered through various mechanisms, including language (see Rodgers 2010). Yet discussions of, for example, race are glaringly absent. On the fourth plane, Born appeals to the social theories of Foucault, Bourdieu, and others, to analyze “the political economy, institutional structures, and globalized circulation of music” (Born 2010a, p. 232). We suggest that it is now critical to examine how the institutional structures that support NIME research help to sustain and reproduce limiting dominant narratives, and where they might instead be transformational.

A similar planar scaling is elucidated with respect to the notion of temporalities. This encompasses moving from the highly studied temporal orderings of musical phenomena such as tempo, rhythm, and so on, on the first plane, through musical events [second], genres [third], and finally to the ways in which music and time are comediated within various shifting technological, cultural, and sociopolitical conditions, thereby shaping how larger musical epochs evolve (Born 2010a). Significantly, by repeating, privileging, and ultimately reifying certain aesthetic and methodological modalities over the course of its history, there is a danger that the musics and musical activities associated with NIME might fall into the same “anti-inventive” trappings that Born has identified within other musical institutions, effecting “a mobile stasis, a capacity to prolong the governing aesthetic by resisting or repressing significant musical change” (Born 2010a, p. 241).

The case of the turntable and its practice is an example of such failings to acknowledge the histories of music technologies, outside contexts of NIME and music technology, more broadly within academia. The turntable as an instrument from what George Lewis (1996) calls a “Eurological” perspective has been well documented, ranging from design concerns (Hansen and Bresin 2006; Redström 2008) to historical narratives that describe its practice as an instrument and aesthetics emerging from the avant-garde movement in the 20th century (Smith 2013; Weissenbrunner 2013). Such accounts often fail to acknowledge, however, the parallel and pioneering artistic and technological developments that occurred within, for example, African American and Afro-Caribbean communities in the mid 1970s, where artists succeeded by “appropriating the most advanced technologies... and used the tools of obsolete industrial technology” (Rose 1994, p. 35). Sophy Smith (2013) describes the creative use of turntables by club and radio DJs from the United States and Jamaica from the 1950s onward, noting how sound manipulation and compositional techniques originally intended for enhancing the dance-floor experience gradually paved the way for new genres of popular musics such as Dub, Hip Hop, and Techno. What we might learn from these accounts is nothing short of the ways in which technomusical research could effect large-scale cultural shifts.

It is beyond the scope of this article to address the applications of Born’s two other planes, those of technology and ontology. But it is no doubt obvious that the former should be highly fruitful for NIME scholars to explore.
Research Diversity in Context

NIME has always appeared to champion the importance of the sociocultural implications of the numerous innovative and technological developments that it produces. Although listed in last place as a relevant topic for the first NIME workshop in 2001, it is evident that the organizers were clearly sympathetic to the idea of addressing the “artistic, cultural, and social impact of new musical interfaces” (see the website archive at https://www.nime.org/2001). And although the original NIME workshop proposal does not explicitly address all these themes, the biographies of the organizers communicate interest in embodiment, intimacy, and collective music making, in addition to their more technical expertise (Poupyrev et al. 2001). Yet how far has NIME research successfully been able to mediate the four social planes set out by Born in order to fully understand the potential reach of its own labors?

It is uncontroversial to state that sociocultural contexts contribute in shaping research directives, theory, and methods. For example, within the broader HCI domain, how and why such changes take place has been observed and studied. Deemed “waves” (Bødker 2006; Harrison, Tatar, and Sengers 2007), these paradigm shifts outline the main ontological and epistemological concerns diachronically, beginning with classical cognitivism, and leading to the current phenomenologically oriented “third wave” HCI paradigm. These orientations reflect the emphasis given to human experiences and the meaning arising from interaction, rather than mere work or the efficient usage of particular systems. The underlying theoretical basis for such research indeed reflects the emergence of the then-recent theories of embodied, embedded, enactive, and extended cognition—collectively known as 4E cognition—and the importance given to them by practitioners (for a broad discussion see Dourish 2004; for the musical implications of such a framework cf. Hayes 2019).

It is clear that the main epistemological shift here is from that of the observational to the experiential, and, more importantly, towards the collapse of the epistemic binary between subjectivity and objectivity. Furthermore, within the third HCI paradigm, various perspectives based on feminist approaches (Bardzell 2010), queer theory (Light 2011), and post-colonial studies (Irani et al. 2010) have emerged that embrace plurality, participation, activism, situatedness, and embodiment [Harrison, Sengers, and Tatar 2011]. Practitioners working in these areas have developed critical and potentially transformational approaches to the study of interaction design by troubling its very ontological and epistemological foundations, through what can be referred to as a mode of “agonistic-antagonistic” (Barry and Born 2013, p. 13) interdisciplinarity. Feminist strategies, for example, include denaturalizing “normative conventions, both exposing their constructedness as human discourses situated in sociopolitical institutions and exploring alternative approaches” (Bardzell 2010, p. 1,305), which is something we align with in this work.

Some of this work addresses the problematic issue of “users as subjects” (Bardzell 2010, p. 1,306) by adopting methods such as, for example, participatory design. This attempts to deal with the prevalent issue of “I-methodologies” (Born and Devine 2016, p. 3) where designers consider themselves to be “typical” users of the objects and artefacts that they design, hence heavily biasing these processes. As NIME is a heavily male-dominated community (Born and Devine 2016; Xambó 2018) gender would be an obvious bias. Aside from study participants, it is also the material conditions—tied to economic and governmental factors—of the working environments and labs, as well as the geographical locations of the researchers themselves that can act as barriers to participation. In the ACM Human Factors in Computing Systems (CHI) community, for example, the majority of participating research centers are situated in the United States and Europe. While there are significant communities of HCI practitioners and scholars emerging within Latin America [https://www.laihc.org], Africa [https://dl.acm.org/conference/africh]i], and South Asia [https://asian-chi.github.io/2020], analysis of the citation practices within HCI research has demonstrated how few citations publications from scholars within these communities receive (see Henry et al. 2007; Bidwell 2016).
Axes for Action

In the following, we highlight and knit together some of the more salient issues that have been put forward. This is far from exhaustive but should provide several points of departure for future NIME research.

Methodologies

Examining NIME’s origins as a workshop that emerged from the ACM CHI conference can help to account for the types of methodologies that have been championed since its inception. CHI has been held each year since 1982, most often within the United States [https://dl.acm.org/conference/chi]. Members of SIGCHI—who have sponsored the conference since its second year—work in “fields as diverse as user interface design, human factors, computer science, psychology, engineering, graphics and industrial design, entertainment, and telecommunications” [https://sigchi.org/about/about-sigchi]. Not included in this list of fields are the arts and humanities, whose methodologies look very different to those of design, computer science, and engineering. In particular, we note the historic prevalence of the demonstration format in the CHI conference, which has endured through NIME, and its strong links to the “Demo or Die” maxim adopted by the MIT Media Lab [Elish 2010]. The NIME community is aware of the limitations of the demonstration format (see Jensenius and Lyons 2016), how it relates to scales of temporality—moving from promoting “wonder” and “awe” in the “lab” to enduring on the “stage”, for example—and how it raises aesthetic and social questions.

Artistic practice as a mode of academic research has strong links to the the historical centering of ways of knowing and producing bodies of knowledge through practical activity rather than qualitative or quantitative methods. This might include performance, or working with materials (Smith and Dean 2009), but also the opportunity to imagine novel ways of collective musical activity. One such example is the Laboratory for Laptop and Electronic Audio Performance Practice (LLEAPP, cf. Green 2016), which has been hosted six times in Europe and North America [Hayes 2019]. Within LLEAPP, participants self-organize within a supportive framework to develop new vocabularies, strategies, and approaches to collective musicking based on their unique sociotechnical histories and typically highly individualized instruments (see Figures 1 and 2). Although NIME 2001 listed “performance experience reports on live performance and composition using novel controllers” as a key workshop topic [https://www.nime.org/2001], this would not satisfy the type of rigorous, yet often experimental, methodological approaches associated with the coconstituting and reflexive relationships between theory and practice within creative practice research today. Here, we are using CPR as an umbrella term, but readers may refer to the writing by Doğantant-Dack (2016) for a discussion of the nuanced variations between research that is practice-based, practice-led, and so on. Creative practice research has been growing as a recognized approach in certain parts of the world for many decades, although it is important to note that its prevalence and acceptance is extremely varied geographically. For example, in the United States, the 2019 Alliance for the Arts in Research Universities conference theme was “knowledges: artistic practice as method”, reflecting the ongoing process of legitimization of CPR in that country. We also acknowledge the messy entanglement between the drive towards the professionalization of arts practice in, for example, the UK as coemerging with the prevalence of new CPR doctoral degrees.

The importance of CPR in NIME has been stressed by many, although its potential to transform the field is still largely underexplored and its methods are still underutilized [Green 2016], and potentially misunderstood. For example, Luke Dahl (2016, p. 77) suggests that “practice-based research in new interfaces for musical expression is rooted in the practices of design and performance”, but seems to circumscribe its application, once again limiting NIME’s scope to that of technical objects. Born’s framework can act as a catalyst if conceiving what this could entail beyond such artefacts—albeit the design of and performance with—is difficult. Decades of exemplary writing by Oliveros is full of such imagined possibilities for establishing new
relationships between sounds and people, artefacts and bodies (e.g., Oliveros 2010). Gurevich has called for an “explicit reckoning” to avoid CPR becoming “increasingly and unnecessarily seen as being in conflict with scientific and technical research” (Gurevich 2016, p. 81). It is interesting to observe how far from the “computer” of HCI, CHI—traditionally a milieu explicitly not engaged with the creative arts and humanities—has managed to advance. Furthermore, as exemplified by Marquez-Borbon and Stapleton (2017), this type of incoherence of vision also comes to the fore when attempting to study and develop NIME pedagogy, as well as establish performance practices with interactive music systems in general. This is not to suggest that pluralisms are not healthy, but that these should be recognized and deeply engaged with and embraced by the community itself.

**Interdisciplinarity**

It is no surprise that epistemological and methodological issues have surfaced within NIME given
that it has always been an interdisciplinary field. Bringing together HCI, computer science, and music, NIME can comfortably be situated within the ever-growing popular discourse of art-science research [Barry and Born 2013]. Although arguably now scaffolded by decades of research into both HCI and computer music, this resistance to disciplinary siloing should not be assumed to produce identical configurations across the board. Barry and Born (2013) outline three potentially intersecting logics of interdisciplinarity that can be helpful. While the new and novel “N” of NIME—supported by the prevalence of the demonstration format—could be thought of as aligning with their logic of “innovation” (often assumed to be tied to the agendas of funding bodies and governmental agencies, where research is guided and driven specifically by economic demands), there may be cases where this produces both inventive as well as anti-inventive outcomes. In the latter case, innovation that reinforces, for example, aesthetic or methodological hegemony is anti-inventive if it shuts down the possibility of alternative modes of NIME practice and research. As a conference, it will be within NIME’s peer-review process that care will be needed to ensure that such possibility spaces are not be automatically rejected for “nonconformity”.

Similarly, although the “accountability” logic often portrays the arts as in service to the scientific research, particularly to make it “public facing” through communicative means, NIME has often taken a radically reverse approach, bracketing off certain more popular forms of music making with technology from its own discourse, as discussed earlier. Even more fruitful may be questions of ontology, where, in the third logic, the very question of what constitutes NIME research can be challenged. In this case, we might move away from the problem solving nature of design issues, including the current issue of “evaluation”. Rather, following some of the more radical work appearing within CHI, we might use NIME to problematize existing assumptions that lie within the relationships between sound, people, and technology, specifically because NIME research cannot be reduced into the siloed domains of musical, scientific, nor social studies; the unique difference to its precursor conference being, of course, that NIME researchers are also musicians often with deeply developed performance practices. The more inclusive the community allows itself to

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become, the more these practices can span Born’s social planes, incontestably enriching the field.

Quantification

As a result of methodological struggles within NIME, quantitative methods have prevailed—perhaps due to the dominance of engineering laboratories and their ability to churn out grant proposals, and hence publish prolifically—despite the variety of other approaches and perspectives at play. This has led to the emergence of various prevalent strands of enquiry including how to evaluate new instruments, whether through user study or through performance, or how to assess the impact of such instruments through a measure of their longevity or commercial adoption. As we have already asserted, these “challenges” may obscure other types of fruitful labor. Although NIME hosts its total proceedings online [https://www.nime.org/archives], it does not archive what may be a much larger number of practice-based works—performances, installation, workshops—that have been crucial in the formation of this body of research. There has been some attempt to rectify this with a formal database of musical proceedings from a handful of conference years [https://github.com/NIME-conference/NIME-bibliography]. Hosting and preserving actual media online is, of course, a task that is more difficult. Without easily accessible means to reference this work, a huge part of NIME’s knowledge base will be excluded from being readily configured within both its history and future formations. Importantly, this exclusion will favor labs and researchers with institutional funding—those who can produce research papers and pay to attend conferences—over independent practitioners.

Through the neoliberal lens of the quantification of the value and impact of research itself, NIME exists within an academic climate in which counting matters: for promotion, for tenure, and for gaining future funding. Yet the favoring of particular modes of research, both through methodology as well as citation practices, contributes to shaping both the historical narratives and future directions of the field. As Sara Ahmed [2016, p. 148] has carefully articulated, “when citational practices become habits, bricks form walls”. Here Ahmed is referring to uncritical habits of sticking to “well-trodden citational paths” that only perpetuate and strengthen the dominance of “writers who just happen to be there”. Related work on citation practices within CHI demonstrates the often throwaway nature of providing references, where no critical engagement with the work is given beyond its inclusion as mere supporting evidence or validation [Marshall et al. 2017]. We should also consider NIME’s discourse surrounding the democratization of DMIs—a theme that comes up repeatedly—against the financial costs of participating in academic conferences, particularly for students and faculty who are not funded by research labs, and moreover artists who are not supported by academic institutions. Anecdotally, during a NIME town hall in which barriers to entry were being discussed, a participant whispered privately to one of the authors, admitting to being surreptitiously in attendance as a nonpaying guest of the conference: It was the participant’s target community, but the registration fees were simply unaffordable. The point here being that this is not an abstract issue but a real problem.

Diversity and Inclusion

Resulting from sociocultural changes born out of civil movements addressing race, gender, and economic inequality, Diversity and Inclusion statements have been put in place as ways to establish fair and “safe” spaces for those working and studying within institutions. Given such developments, academic conferences followed suit. In spite of these well-meaning approaches, we must however continue to take a critical stance and ask whether or how the NIME Diversity Statement provides a productive framework for genuinely increasing the diversity of its community and research outputs. That is, how is the community actively supporting minority and marginalized groups not only to participate, but also to be seen as educators and to shape the field? Openness to diversity does not automatically result in it. What types of approaches will the NIME community undertake in its diversity
work to avoid not only leaving out those not within positions of power and whose practice lies outwith dominant NIME research (Marquez-Borbon and Stapleton 2017), but also in working towards changing the ways in which such narratives are formed and structure the field itself? In particular, as Tara Rodgers has elucidated in her work on the history of the synthesizer (Rodgers 2010, p. v), the effect of language and the construction of narratives can be crucial here: “[A]udio-technical language and representation, which typically stands as neutral, in fact privileges the perspective of an archetypal Western, white, and male subject.”

Within the shaping of such narratives, we may attend to the processes of citation practices—as discussed previously—choices of not only keynote speakers and performers, but also the processes that determine who sits on the Steering and Program Committees of the conference. Furthermore, although there is a “Fair Play” clause in the ethics guidelines for NIME publications (https://www.nime.org/ethics), which states that papers should be valued in terms of their intellectual content, regardless of authors’ gender, belief system, sexual orientation, or race, we are tempted to wonder how biases are mitigated within the make up of the reviewer pool itself. How can we rigorously assess performance work that might be unfamiliar or diverge from the “expected” aesthetics that have become favored, or those works that suffer from poor documentation due to a lack of resources? We have both reviewed well-documented performances that failed to deliver in the conference, and vice versa. See our earlier comments on the misleading nature of the demonstration format. How can we continue to support performance work from practitioners who may be the only ones who play their instruments, but simultaneously request anonymous video submissions for double-blind peer review?

Hosting the NIME 2019 conference in Porto Alegre, Brazil, was important given that this was the first event to be realized in the entire region of Latin America. This geographical change invited and facilitated regional parties to introduce their work into the larger NIME community, work that may otherwise have been absent had the conference been hosted elsewhere. Although this is certainly encouraging, we observe that the participation of Latin American researchers at the 2019 conference turned out to be rather limited. Out of the 88 publications presented at the conference, 18 publications included Latin American authors or coauthors. Thematic lines of research were mainly concerned with the development of new systems and their implementation in a range of diverse usage scenarios. Only a single paper presented a case outside this mainstream, developing a history of Latin American NIME-related activity (Lerner 2019). This paper is particularly important within discussions of NIME diversity as it illuminates a rich history of instrument development, parallel to the main historical narratives presented within audio discourse in general. As Martín Matus Lerner (p. 232) states, “Latin America has configured a fertile ground for experimenting in the NIME field” in its recent history, where such developments are not only influenced by their US or European counterparts, but also reflect the local context in which this work takes place. Local technological developments are not mere imitations, but are original and “hybrid” inventions that stand on their own.

Conclusion

We have highlighted several ongoing themes and discussions that have come to prominence within the NIME community. Although some of the recent NIME discourse appears to be progressive with regard to increasing participation in the field, we stress the importance of a critical approach and attention to its structural foundations. For example, linking together our discussions of quantification with that of gender, we might consider the limitations of the use of metrics that we now see being applied to this domain within NIME discourse, as discussed above. As Marie Thompson (2020, p. 13) has noted, this process can actually reproduce gender as a rigid category and at the same time prioritize approaches which ultimately turn out to be about “surface over structure.” Although quantitative data can certainly help to demonstrate the impact of certain
efforts, or represent the state of affairs, structural responses are also required. We wish to challenge the NIME community to respond affirmatively to these ideas, even where the incentive for doing so may be counterintuitive, given the amount of care and labor that will be required, and the increasing commodification of academic research. We echo Green’s (2016, p. 79) sentiments in relation to CPR and NIME that “collective understanding of the research endeavor, rather than a competitive one where researchers themselves are commodities” is needed address both the epistemological and sociocultural fractures that NIME is experiencing.

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