

NIME Design and Contemporary Music Practice: Benefits and Challenges

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ABSTRACT

This paper deals with the question of how the development of new musical artifacts can benefit from deeply engaging with contemporary musical practice. With the novel ideas produced by the NIME community manifested in musical instruments in continuous use, new research questions can be answered and new sources of knowledge can be explored. This can also be very helpful in evaluation, as it is possible to evaluate the qualities of an instrument in a specified context, rather than evaluating a prototyped instrument on the basis of its unrealised potential. The information from such evaluation can then be fed back into the development process, allowing researchers to probe musical practice itself with their designs.

1. INTRODUCTION

The topic of this paper is the delimitations of the development of new interfaces for musical expression, especially in regards to researcher’s engagement with contemporary musical practice through artifacts. That is to say, how the objects and systems we produce are able to function in similar ways as traditional instruments and be incorporated into musical practice, preferably over an extended duration of time. This can be expressed in a more general way. Namely, 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? In cases where the boundaries of the research are not consciously motivated, much could be gained by having a discussion within the community about the underlying intentions and goals of NIME development. These discussions can be especially helpful in the evaluation of projects and in determining their contribution to knowledge.

In the NIME community, there is awareness about the lack of longitudinal effects of new musical interfaces in contemporary music practice. Dobrian and Koppelman have promoted the benefits of building interfaces for actual musical expression instead of “new interfaces for controlling sound” [2]. Jordà writes that “Many new instruments are being invented. Too little striking music is being made with them” and goes on to define some central concepts in the relationship between musician and instrument [4]. Orio et al. [7] use HCI-concepts to suggest how musical interfaces

can be evaluated by using learnability—the time it takes to “control a performance with a certain controller”—as an important consideration. While formalised evaluation and analysis of artifacts is necessary, the process in which artifacts are produced and the structuring of the design activity is also a worthwhile place from which to view these issues. In this paper, the benefits of engaging with musical practice from a design point-of-view will be argued.

To narrow the scope of the ideas presented here, the focus is: in what ways does research on new musical instruments engage with contemporary musical practice, and what can be gained by doing so, especially from a design perspective?

The next section will offer a brief analysis of the current NIME artifact development practice, and some thoughts on how this practice could be expanded. After that, a set of benefits that can be gained by such an expansion are presented and contrasted with the challenges involved in engaging practice.

2. WHAT WE ARE BUILDING

The field of NIME is a heterogenous field of experimentation where many ideas and design strategies exist in parallel. It is also an artifact-centered field of research, in which musical artifacts—instruments—are developed, presented and discussed. Although the definition of instrument in this context is, and perhaps should remain, ambiguous, and a source of rich discussion, see for instance Bowers’ and Archer’s meta-study taxonomy of *hyper*, *meta*, *cyber*, and *infra-instruments* [1], it can be enlightening to investigate what practices are supported by the produced instruments. Especially, in what ways contemporary musical practice is supported or otherwise engaged with.

It is a common for performers or composers to create new tools with the purpose of realising personal musical goals. These goals can be open-ended musical explorations or more specific tasks, e.g., the performance of a specific composition. See for instance the work of Kimura et al. with *The Augmented Violin* that could be classified as both exploratory and specific [5]. In such cases, it is very possible that the results of the work indeed become a part of musical practice, outside of the circle of people directly involved in the project. More often, in NIME development the designed artifact is not primarily presented as a musical instrument in its own right, but rather as being a necessary tool in an exploration of something else. This can be a digital or mechanical technique that is being shown to work, a proof-of-concept of a mode of interaction that is explored, or an exploration of some underlying mechanism of instrument-making, such as mapping. The work of Snyder and McPherson on the *JD-1* capacitive touch keyboard is an example of such a project [8]. The explorations of DJ scratching on the reactable by Hansen and Alonso is an

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other example that, while evaluated with performers from relevant musical practice, still primarily was constructed as a proof-of-concept of the combination of scratching models and the reactable interface [3].

These types of development goals are useful in answering many research questions, but there are many questions about musical practice that are hard to reach with such approaches. To engage with those questions is to engage with musical practice, but to do that, the musical instruments produced must function as such.

As researchers, we must consider how we are limiting our research questions by not going all the way with our designs to produce musical instruments that can function in a contemporary musical practice. It is important to also consider such issues as the strain of rehearsals, or touring, a musical instrument design possibility. To what extent are our artifacts really exploring the practice of contemporary music if we exclude such activities from our design reasoning?

3. BENEFITS

To be clear, the goal here is not to criticise or invalidate the work that is being done in the NIME community. Rather, it is a suggestion to ensure that we include in the field all areas where interesting NIME research can be done. What then can be gained from immersing NIME research further into contemporary musical practice? The following list is a suggestion of the most important benefits:

1. Exploitation of tacit knowledge connected to embodiment and performance.
2. Instruments actually ending up in continued use make for more matter to study, as more performers, composers, and audiences engage with the artifact. Audience or participants can be interviewed, metrics or use-data can be gathered.
3. Instruments accepted into active musical practice will be used for longer periods of time, allowing for the study of such things as virtuosity, how new musical instruments change musical practice, or other longitudinal aspects of NIME, such as the emergence of new modes of learning and practicing, as described by Oore [6].
4. Instruments can be evaluated by how they perform in specific practice, i.e., it is not only the artifact itself, but its realised function in a specified context that is evaluated. Evaluation is then based on actual performance results instead of the instrument prototype's unrealised potential.
5. Other aspects of artifact characteristics can be discovered to be important when used in practice, compared to a laboratory setting. Thus, new knowledge can be gathered about what research questions to pose to create more usable artifacts. Also, in this way the instrument functions as a probe that gathers information about the practice itself.

4. CHALLENGES

In order to reap the benefits described above, one must meet an extended set of demands, different than the challenges of laboratory work. Some of these challenges are traditionally more closely related to industrial design or other more product-centered design practices. Yet, there is no reason to consider them to be skills that are external to the NIME community. The essence of the following list of challenges

is that a designer must first build something interesting and usable, then communicate the worth and possible use of the artifact to the community, and when contact is established, make sure that the artifact supports all the activities necessary in contemporary musical practice.

1. Demands on durability are increased in combination with larger penalties for failure, e.g., postponing a laboratory session is low penalty whereas an on-stage failure is high penalty.
2. In case of failure, mechanisms must be present to rectify the situation. This includes a wide array of contributing factors, like spare parts, documentation, technical support and disseminated knowledge about use and repairs. Here, the use of open software and hardware becomes an interesting factor that can ensure longevity and sustainability of an instrument.
3. To encourage a wider use of an artifact, successful communication of how the artifact can be used, and also how it can function artistically, is important. This can take the form of everything from technical manuals, to workshops, courses or documentation of the artifact itself in action.
4. The instrument must be somewhat malleable to support its use in new compositions and contexts, yet still conceptually rigid enough to keep its identity. If the instrument is changed to fit new musical demands every time it is used, there will be no continuous musical practice to research. On the other hand, instruments that are tailor-made for a certain musical context, content or composition might be too limiting for other musical explorations to be engaging.
5. From a general perspective, the structures and processes that drive the design of new instruments must be compatible with the structures and institutions that finance and produce the education and performance of contemporary music. There might be structural and cultural difference that make the process of putting on a concert, for instance, incompatible with that of a research project. Careful planning and design is needed to create a process in which both artistic and research agendas can be fulfilled. This is perhaps the biggest obstacle to the NIME community's engagement with practice.

5. CONCLUSIONS

There are clear benefits to do NIME-research that deeply engages with contemporary musical practice. New research questions—even new modes of research that exploit participants with rich embodied knowledge—can be found and explored. These benefits are brought up by some researchers in the field, yet, there is no perceivable shift towards such a way of doing research. Perhaps then the obstacles or structural issues that prevent this from happening could be explored.

The expansion of the domain of NIME design will become increasingly important, following the trend of modular design of electronic devices, system-on-chip-computers and building-block-like kits for prototyping. It is very possible that the prototyping of new musical instruments will be increasingly more present in contemporary music practice. Thus, future music practice could increasingly be doing its own NIME development, dissolving the boundaries between instrument design and practice even further. Therefore, increasing the NIME community's presence in practice will be

an investment in the future, since the expertise and knowledge gathered in our community could be even more sought after in the coming years. Note that this change is as much a projected maturity in the audience of contemporary music as it is a foreseen change in the attitudes of practitioners.

In one way, the discussion can be viewed as a question of ownership of field of study. One could argue that once some aspect of a possible musical instruments has been successfully prototyped, it is a task for the industry, organologists, musicologist and others to produce, disseminate and study the effects of whatever novel idea the NIME community has produced. From a design perspective however, this leads to a disastrous disconnect between practice and design, robbing designers of an indispensable experience of working close to their material in context. In stark contrast to a laboratory evaluation, collecting data on an instrument in extended use by several practitioners in several contexts is an invigorating and a bountiful source of new knowledge. Interdisciplinary studies could be a mitigation of the problem, but the disconnect between designer and material would still be present.

As a final note, a deep engagement of instrument designers in practice could also prove to be an important source of knowledge about practice itself. Musical practice can be researched through the use of the artifacts as technological probes, revealing tacit and hidden information about practice by expanding and challenging it through the use of new musical instruments.

6. ACKNOWLEDGMENTS

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