Collective Attachments and Community Responsibilities: The Impact of NIME Research

TOVE GRIMSTAD BANG, STMS Lab, IRCAM-CNRS-Sorbonne Université, France
FLORENT BERTHAUT, CRIStAL, Université de Lille, France
BENEDICT R. GASTER, University of West of England, UK
RAUL MASU, Conservatory of Music F. A. Bonporti, Italy

Digital technologies are deeply intertwined with music. They make way for collectives and communities of practice to form, often in dialectic processes of practice shaping technology and technology shaping practice. They enable new forms of artistic creation, expression, and distribution, and are the reasons why communities like NIME exist. At the same time, digital technologies have a growing environmental footprint, from manufacturing and mineral extraction for devices, as well as the energy consumption and waste associated with digital infrastructures, altogether contributing to environmental degradation. Hence, we are in a situation where many of the activities and infrastructures related to digital technology, and to NIME research, cannot or should not be maintained in the future if we want the earth to remain liveable, despite our complex attachments to these. This workshop aims to create a space of structured, collective reflection, for members of the NIME community to discuss the consequences of our research, the values that it conveys, and to make a first step towards imagining what a redirection of NIME research could look like in mid- to long-term trajectories towards sustainability. What renouncement or substitutions are required for NIME to move towards alternative practices, 'subtractive' practices, 'doing without' or 'doing with less'?

Additional Key Words and Phrases: Sustainability, Attachments, Redirection, Politics, STS

1 Introduction

Digital technologies contribute to the global environmental footprint through manufacturing and mineral extraction and through use and maintenance of digital infrastructures. The more our modern, digital society develops, the more we lose capacity to manage and absorb what is produced in excess, and as a result, the global north systematically relegates electronic waste to the global south [24]. The spread and development of new digital technologies come with a rebound effect, where increased efficiency leads to increasing demand and, in turn, increasing environmental impact, a development that cannot be sustained in the long term [16, 22].

At the same time, musical expression is so tightly linked with the development of music technology [6, 25] that we see music genres shaped by interface presets and constraints in music software and hardware [20], and research and practice communities like New Interfaces for Musical Expression (NIME) would not exist without this dynamic. Although the systems and infrastructures behind the digital technologies used in music practice and research contribute to environmental degradation and are ultimately unsustainable, they also enrich artistic expression, foster collaboration, and enhance our ways of living. So, beyond the direct environmental footprint of the digital technologies that make up essential components to our communities and practices, as well as flying to conferences among others, what role does our work in NIME research play in the destructive behaviour of our societies, and how does NIME fit in a mid- or long-term trajectory toward sustainability? Can something that is a *new* interface ever be one that is not geared towards generativity and addition? Can there be a subtractive approach to interface design for musical interaction? How can NIME as a community imagine *doing without* or *doing with less*? And ultimately, *does our research contribute to building a world that corresponds to our values*?

To tackle these questions we must learn to clearly articulate the values that shape our work, and understand the complex relationships between our research, the environment and the societies in which we live. We are deeply attached to our technologies, both as individuals and as societies, and immediate abandonment in search of a more sustainable future is likely to be brutal, undemocratic, and serve a series of repercussions across the long and complex value chains involved in the infrastructures behind digital technologies [3, 16]. But in the same way that not all humans are equally responsible for climate change, not all technologies are equally resource intensive. However, measuring the environmental impact of a specific technology is very complex, if not impossible [22]. Hence, while we are not able to measure the exact impact of

Authors' Contact Information: Tove Grimstad Bang, STMS Lab, IRCAM-CNRS-Sorbonne Université , Paris, France; Florent Berthaut, CRIStAL, Université de Lille, Lille, France; Benedict R. Gaster, University of West of England, Bristol, UK; Raul Masu, Conservatory of Music F. A. Bonporti, Trento, Italy.

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our technologies, we *are* collectively attached to the infrastructures behind these, and a *redirection* needs to take place if the earth is to remain liveable [3, 7, 16].

1.1 Different Approaches to Address Sustainability

In Human–Computer Interaction (HCI) research, we see two main trajectories of works grappling with sustainable digital technologies: The first draws from technology-optimism and takes a stance of *ecological transition*. It relies on technological advancements and making technology 'greener' and more efficient to avoid catastrophes. The second trajectory, more commonly found in the design sub-community of HCI with roots in the 'ontological turn' in anthropology, a posthuman or more-than-human approach, typically adopting a critical stance of *ecological reconnectionism*. The latter argues that we are finding ourselves in this situation—the Anthropocene—due to an ontological disconnection between humans and non-humans, hence the urgency to decentre the human and to reconnect with nature and the living [3, 18]. Both stances share an ontological continuity with the way our world is organised, within modernity and modern capitalism. Currents with roots in the ontological turn are especially critiqued for being depoliticised and for not providing actionable insights [1, 2, 10, 11, 16, 18, 19, 23]. Other, more marginal stances take approaches of exodus and revolution, in form of rupture or removal from the organised world (such as Harney and Moten's Undercommons [8]). Hence, as bluntly described by philosopher Alexandre Monnin, we find ourselves between two extremes, *business as usual*—carbofacism—on one side, to rejection of technologies, civilisation etc.—an immediate and global exit of the anthroposphere despite our attachments to it (or entanglements with it)—on the other [16].

In NIME research, questions around the 'constant pursuit of novelty' [12], innovation [9], as well as the longevity, durability, obsolescence and disposal [14] of new interfaces have been discussed for over a decade [13, 15, 17]. In addition to concerns regarding the (un)sustainability of fabrication practices and the lack of continued musicianship and established performance practices, this discussion opens up for a problematisation of the generative ontology of design as a discipline [4] and its never ending 'world-making' activities and performances.

1.2 Objectives

Considering the nature of design—and NIME—itself being geared towards innovation and generativity, we aim to adopt a critical stance that seeks to rupture with this ontology. To do so, we propose a workshop centred on our collective dependencies on large, unsustainable technology infrastructures. Then, through a deeper understanding of the NIME community's attachments to these infrastructures, we aim to explore how or if the community collectively can *redirect* some of these dependencies and attachments. With this approach, we seek to offer a different avenue towards sustainable futures than those outlined above and we are brought to consider potential substitutions and renouncement in planned, democratic and non-brutal ways [16].

Furthermore, with a different ontological grounding of NIME practice, we can start imagining 'subtractive' practices, 'doing without' or 'doing with less', which both addresses computation within planetary limits *and* opens up avenues to respond to the lack of continued musicianship and community in NIME by bringing about and uplifting practices that can sustain through time and withstand technology trends [1, 21]. We can imagine practices where we nurture our abilities for proficiency [21], transmission and preservation of bodily knowledge. Such active engagement and growth, through what Bidet and Rigoulet describes as "an activity involving sustained learning and practice, in proximity to oneself and the materials involved, where one can progress, improve, and create indefinitely[1]" [2] stands in stark opposition to the ever more increasing, digitally led, division of labour that perhaps ultimately leads to deskilling *and* skill rebound, where lowered demands of effort to reach proficiency leads to an increase in use and hence increasing environmental footprint [5], not to mention increasing global inequalities.

We adapt the *Atelier SEnS*, the Sciences, Environnements and Societies Workshop[2] developed by Sophie Quinton and Éric Tannier, and adjust the general focus on the social and environmental responsibility of scientific research to a focus on NIME research. The remaining paragraphs of this section, as well as section 2, are adapted from the *Atelier SEnS*, distributed under the licence CC-BY-NC 4.0.

The objectives of the proposed workshop are: 1) To provide a setting to collectively discuss the consequences of our research, the values that it conveys, and more generally how NIME research fits in the Anthropocene. 2) An attempt to broaden the discourse around societal and environmental impact and NIME research, and build upon already existing dialogues concerning the apprehension towards the innate 'new', 'novelty', innovation-focused discourse in our field, from which we potentially can start articulating a different ontological underpinning of works surrounding music technology (and sustainability).

[1]Translated from French to English by authors.
[2]https://sens-gra.gitlabpages.inria.fr/atelier-impacts-recherche/en_resources.html

This requires some understanding of the history, economics, law, philosophy, sociology, politics, and ethics of our disciplines, for which many of us have received no training. The SEnS workshop has been designed to provide tools and resources for this purpose, and we will make use of these. The workshop therefore also provides an introduction to science and technology studies, in particular to the philosophy, history, and sociology of science. No prerequisite knowledge of the subject matter is required to participate in the workshop.

Finally, the objective is not to reach a consensus between the participants, but rather to provide everyone with the opportunity to reflect and take a stance on current environmental and social issues in a respectful and constructive setting. By confronting ideas and sharing knowledge, the goal is then to find common ground across our differences. We aim to provide a space for questions around "what really deserves to be produced, how, for whom and what? [... and make sustainable futures] a space for inquiry, rather than moralising commands [of how to make sustainable choices] from [those who know 'better']"[3] [1].

2 Workshop Structure

This full-day workshop will take up to 15 participants. One of the facilitators have already followed a SEnS workshop and facilitated an adaptation of it, and another have organised previous NIME workshops related to sustainability.

2.1 Organisation

The workshop will adopt a set of roles and rules to make sure everyone can speak freely. We are aware of the possible reluctance towards rules and roles, in such contexts. However, we see several good reasons for adopting such a format. On the one hand, rules are needed to ensure that speaking time is distributed equitably, so that everyone has the opportunity to express themselves. Secondly, we want to avoid an exchange of preconceived opinions on the subject, as the aim of the workshop is to initiate structured, collective reflection, and find some common ground without hiding differences. Finally, with a setting that differs a bit from the standard in academia can help participants take a step back to reflect on their work and feel safe while discussing topics on which they are not specialists. For all these reasons, it is important that participants agree at the beginning of the workshop on the confidentiality of the opinions and experiences shared during the workshop.

2.2 Schedule

Duration	
30m	**Welcome and introduction.** Rules are introduced and roles are assigned.
1h	**Why do you work in NIME research?** Beyond individual answers that mix personal interests and opportunities, participants are encouraged to consider the social and economic elements that have shaped their experience.
2h	**Mapping of values and attachments.** Clearly articulate important attachments, tensions, contradictions or imbalances between different components (epistemic, economic, social, environmental) of our work in NIME research.
1h	**Discussion based on documentary resources.** Identify polarising questions within the group and start a discussion around them relying on relevant texts from STS and humanities.
1h15m	**Looking ahead and redirecting our attachments.** Formulate possible scenarios for NIME research in 2046, assess them for their likelihood, impact and desirability so as to envision a common scenario of redirected attachments for NIME researchers that could form the basis for more in-depth discussions.
30m	**Final remarks and reflections.**

For a detailed schedule, please refer to the complete workshop program available on the workshop website[4].

3 Call for Participation

We invite members of the NIME community at any stage of their career to submit reflections on their own practice and *whether or how their research contributes to building a world that corresponds to their values*. Reflections can take any shape or form, including music, other multimedia, poetry, drawings, text etc. Difficult, ambivalent and open-ended reflections

[3]Translated from French to English by authors.
[4]https://tovebang.com/workshop/nime26.html

are welcome. We hope to gather people who are interested in exploring ways of knowing and ways of theorising NIME research that are less inclined towards innovation, and together move beyond questions of individual responsibilities and try and make larger scale community reflections.

4 Organisers

The workshop is organised by members of the NIME environmental committee.

Tove Grimstad Bang is a Postdoctoral researcher at IRCAM, working with Human–Computer Interaction and interactive technology in contexts of music and movement practice. Her current research critically examines the sometimes extractive tendencies of digital technology towards bodily knowledge and community knowledge in artistic practices, along the extractive tendencies of digital infrastructures through their environmental impact, and how these two coincide.

Florent Berthaut is an associate professor at CRIStAL, Université de Lille, where he leads the MINT research team. His current research explores both shifting extended reality musical instruments from the virtual to the physical space, and studying the impact of digital musical instruments on the audience experience.

Benedict R. Gaster is a associate professor at UWE, where they lead the Expressive Computer Interaction group. Their current work explores notions of NIME through a post-human lens, with a particular focus of Computing within Limits.

Raul Masu is Professor of Electroacoustic and Multimedia Composition at the Conservatory of Music F. A. Bonporti in Trento, Italy. His research focuses on digital musical instruments, with particular attention to sustainability, accessibility, and contemporary music practices. Alongside his academic work, he is active as a composer and performer of electroacoustic and interactive music with his practice focusing on performance ecosystem.

5 Technical/spatial Requirements

All required reading materials for the workshop will be provided by the organisers. The workshop requires in-person attendance and can take place indoors or outdoors depending on participant needs and weather. For running the workshop indoors, we need a room with 5 tables so that participants can sit and work in groups, and a white board and flip board paper if possible. No computers or other technical equipment is required.

6 Ethical Standards

For this workshop to provide a space for free and open communication, we introduce a set of guidelines as described in section 2.1. We will accommodate any special needs, and ask participants to please reach out to us if there is anything we can prepare in advance to facilitate participation.

Acknowledgments

This workshop is an adaptation of the Atelier SEnS[5] distributed under the licence CC-BY-NC 4.0. Adaptations were made throughout the workshop program to address NIME researchers specifically, as opposed to 'scientific researchers' as in the original version.

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