

# Looking NIME in the ‘I’: Tracing the social life of digital musical instruments

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## Abstract

For 25 years, the NIME community has built digital musical instruments (DMIs), yet discourse remains tethered to technical definitions or subjective evaluations of ‘success.’ This paper argues that instrumentality is not a stable property defined by sound, gesture, or form, but rather an emergent quality shaped by cultural, social, and technological contexts. I introduce an analytical exercise that identifies ‘loci of influence’ (object, technology, performer, spectators, community, and commerce) to trace how a DMI functions as an instrument in practice. I apply this exercise to three contrasting examples (the bespoke Chaos Bells, the software environment Max, and the commercial MiMU Gloves), thereby demonstrating how this framework allows for the objective comparison of technologies with vastly different scales and social trajectories. This perspective offers a tool for articulating the cultural life of instruments on their own terms, moving beyond fixed definitions of ‘instrument’, constructed frameworks, or personal preference to understand the diverse ways instrumentality is assembled in the world.

## Keywords

digital musical instruments; instrumentality; cultural context

## 1 Introduction

Building, studying, and understanding digital musical instruments (DMIs) is the central concern of the NIME research community. It can therefore be surprising that there is little work within NIME that rigorously explores what we mean by the word ‘instrument’ beyond technical factors, or that questions the implicit criteria by which DMIs are judged to be ‘successful’ instruments.

While the NIME acronym historically stands for ‘Interfaces,’ this term has become an increasingly narrow descriptor for this community’s output. The computer+mapping+interface paradigm [56] describes a technical state, much like a bank machine or a microwave clock, but it fails to capture how a technical assemblage transcends the sum of its parts and becomes a vehicle for artistic and social expression. A very NIME-ish interjection here might be “But a microwave clock *could* be an instrument!”, an answer we probably all relate to, but might struggle to explain or discuss beyond personal preference or opinions. This is the core of the problem: we lack a critical perspective that can account for the cultural context and social life of a DMI. We need a perspective that fully considers the myriad of social, cultural, and commercial influences that can make a microwave a DMI rather than just a microwave, one that we can use to orient ourselves

within the vastly different sets of influences that are unique to every DMI. Though NIME has evaluative frameworks, this discourse often falls back on a loosely defined sense of whether a DMI is ‘good’ or ‘successful’ (according to whom?) or ‘works well as an instrument’ (based on what criteria?), which risks obscuring forms of significance that do not look like broad technical or commercial success.

As a starting point, I argue that an *interface* is a collection of technical factors, whereas an *instrument* is an operational and cultural status. To resist the term ‘instrument’ in a contemporary NIME context is to ignore how these devices have moved beyond technical prototypes into social, political, and artistic domains. This paper is concerned with the ‘I’ as Instrument, focusing not on the technical sound-producing components, but on the points where they interact with people, culture, and history to become instrumental in practice.

However, there is no stable definition of the word instrument that would go very far in helping with this problem. There is no useful physical taxonomy: because computers have separated sound from physicality, DMIs can look like, sound like, and be made out of anything (or have no physical form at all). There is no useful sound taxonomy: the computer now enables an ever-expanding frontier of sonic possibilities. Gestures may be involved (or not), but do not have any necessary connection to the resulting sound. The only stable factor is the technology involved, which is why this paradigm is so enduring – but this stability also encourages a focus on devices and mappings rather than on the social and cultural trajectories of instruments. Taken together, these factors make it difficult to define ‘instrument’ in any stable way for DMIs, and they encourage a focus on technical architectures rather than on instruments’ social lives.

But, DMIs do not exist in a vacuum. The things we make and the work we do are connected to music, and as such DMIs are cultural entities as much as they are technical assemblages. We are doing cultural work, and DMIs have profoundly affected culture, not only in experimental DMI performance circles but also in mainstream music culture. A DMI may be important if only one person plays it, if it appears only a handful of times, or if it exists primarily as a short-lived commercial object. Yet, though NIME output accounts exhaustively for the technical aspects of DMIs (as it should), precious little focuses on how DMIs affect, or are affected by, cultural forces, or on how their social lives unfold over time. Despite recent calls from within the community to more fully account for the ways our work intersects with the political realities of the wider world [9, 27, 43], methods to account for the cultural and social context of DMIs have, so far, been largely absent.

This paper aims to provide a starting point for that wider discussion. I begin by explaining the reasons and influences that instrument remains so ill-defined in a DMI context, and why it is so difficult to generalise about cultural factors. Then, I review existing work that proposes that instruments become instrumental



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NIME '26, June 23–26, 2026, London, UK

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through their use, and explain why adopting this viewpoint may reveal latent factors is more useful for this discussion than any stable definition or implicit success metric.

I then present a perspective for identifying and understanding the myriad cultural and social factors that contribute to a DMI becoming instrumental. This perspective examines DMIs by grouping influences into loci of influence, which not only allow us to see commonalities between DMIs that may appear to have little in common, but also to understand larger trends. Finally, I present a case study that uses this approach to compare two very different DMIs, Chaos Bells and Max, and discuss the resulting insights. I argue that this framework is a tool for widening our discussion of DMIs from one centred on technical aspects and evaluative judgements to one that includes a critical discourse traversing a set of social, cultural, technical, musical, and design factors that may be as singular as the DMI itself.

## 2 Why definition is difficult

### 2.1 Computational complexities

The presence of a computer has created fundamental problems for DMI definition. The most common paradigm of a sound-generating computer connected to a control interface via mapping [56], usefully distinguishes DMIs from acoustic instruments, but obscures almost everything else. This very presence of a computer has exploded our notion of what a musical instrument can be, and as a result there is no stable notion of instrument in this context, even though this paradigm continues to structure much NIME discourse.

Control dislocation also muddies the waters. Control dislocation, or the separation of an instrument's physicality from the sound it makes [41], means that an instrument has no stable physical, sonic, or gestural taxonomy. A DMI can look like anything, sound like anything, or require no gesture at all [8]. More complicated yet, gestures may trigger automated sequences in which the performer has no real-time control, raising new questions about liveness and what musical gesture means in this context [3, 4].

### 2.2 DMI diversity

Further, this decoupling makes it hard even to locate where a DMI begins and ends: in an interactive sound installation, is the DMI the environment, the laptop, the DAW, or the OS? Though not an entirely new complication — singers, for example, have long discussed the blurry boundaries of their selves and their voice [2] — a computer is such an enmeshed combination of technological factors with any means of physicality that it can be difficult, if not impossible, to clearly view the relationship and interplay between these other entities and the DMI itself [45]. Some DMIs, especially augmented instruments, may use the existing design language of a traditional instrument to be recognised as such [37], but this is not in any way required, which further complicates attempts to define instruments in general terms.

DMI practice also resists stable comparison. Much DMI work is radically experimental, with no shared vernacular or repertoire [8]. While some instruments have found homes in specific playing traditions or popular genres, many do not, which makes it hard to compare them along conventional dimensions such as genre, role, or repertoire. Recent NIME work turns instead to communities of practice [34] and performance ecologies [35, 59] as lenses, but these perspectives still capture only part of the expanding spectrum of DMI use.

## 2.3 An array of vocabulary

NIME is awash in a sea of overlapping terms for instruments: artefacts [19], interactive music systems [18], assemblages [13], interfaces [42], meta- [20], infra- [12], and hyper-instruments [30] ... all while rarely pausing to ask what 'instrument' itself is doing in this discourse [31, 57]. This proliferation suggests not that the concept is meaningless, far from it. What it indicates is that we lack shared tools for talking about the social and cultural work instruments do.

## 2.4 The HCI and university context

NIME's origins in human-computer interaction (HCI) have left a lasting mark on how we understand DMIs. The community began as a CHI workshop, and has since become a "highly specialized field of HCI" [58]. The HCI paradigm of a 'user' and something they 'use' [36] persists in NIME's heavy focus on evaluation [5, 6, 32], and in the assumption that success can be measured at the level of the artefact and its immediate circle of players. Though work in HCI has recently emerged that poses a strong challenge to this paradigm [28], these challenges are relatively recent, and the influence of the user-device paradigm can be seen in early NIME papers that depart explicitly from this HCI perspective. While these frameworks attempt to bring rigour to the field, they often function as constructed metrics that attempt to quantify what is essentially personal preference or narrow technical performance. By centring the musician-device dyad, these studies often measure a performer's immediate satisfaction [14, 26, 44, 51, 61], or seek to understand 'users' [11, 29, 62]. (While work does exist that considers the perspective of the audience [10, 21], it is uncommon.) Some critiques argue that HCI-style values are a poor fit for evaluating DMIs [46, 52], but the centre of gravity still tends to sit at the point where human and device meet. Even where practice-led, musicological, or phenomenological approaches are used [16, 22, 39, 50], they fail to account for the larger social and cultural trajectories that actually define an instrument's life.

An instrument does not become instrumental because a user study participant gave it a high score on a Likert scale. Rather, it becomes instrumental through its operation in the world: its influence in culture, its presence in curricula, its commercial availability, its symbolic power in a performance ecology. To understand DMIs, we must look past these constructed metrics and toward the objective forces that allow them to persist.

## 3 Becoming Instrumental

This struggle with ontology in organology and music technology has led many writers to treat 'instrument' not as a constant quality but as an emergent property shaped by complex factors: an instrument is not born, but becomes [15]. The idea of instruments 'becoming' through their social life is well established in work on traditional instruments. Bates likens creating a musical instrument to creating a golem that operates by generating "desire and affect," noting that instruments achieve autonomy only when "entangled in webs of complex relationships" that shift across socio-historical contexts [7]. Hardjowirogo [24] similarly argues that instrumentality is constructed through an interplay of intention, learnability, culture, and audience perception. Other accounts emphasize process: Waters describes a musical instrument as "not an object, but a process" [60], Théberge observes that instruments are "made-over" by musicians in the course of music-making [54], and Tresch and Dolan ask what "larger

arrangements of technology, social roles, and elements of the natural world” instruments are woven into [55].

One influential thread comes via HCI’s engagement with Heidegger. Dourish [17] adapts the distinction between things that are “ready-to-hand” and “present-at-hand” into the language of embodied interaction [25]. Tanaka and Donnarumma [53] bring this to DMIs by describing a process through which the body “becomes instrumental”, shifting across cultural contexts. Within NIME there is already a strong strand of thinking that treats instrumentality as something that arises in and through practice rather than residing in devices as such.

### 3.1 Applying this to DMIs

Where these ideas fall short for NIME is in specifying how becoming instrumental happens for particular DMIs. It is easy to say that instruments become so through use, while failing to ask which aspects of design, context, community, commerce, and other factors might matter — or how they matter differently for different instruments. The microwave-as-instrument thought experiment, for example, only becomes analytically interesting if we can say along which lines its path diverges from a bespoke DMI or a commercial software platform. I propose that the process of becoming instrumental is too abstract a place to focus; instead, what is useful is to attend to the contributing factors in this process, and the conditions under which they operate. This shift in focus also allows us to take seriously DMIs that might otherwise appear ‘unsuccessful’ from a narrow NIME vantage point, but still allow us to understand how and why they resonate elsewhere.

Consider crowdfunding campaigns: many DMIs on Kickstarter attract enthusiastic funding but little long-term musical traction [38]. Understanding why their potential is compelling at the outset, yet their actual applications are limited, likely requires attention to commercial narratives, expectations about ease of use, and alignment with existing performance conventions. Classic examples such as the Moog synthesizer show this entanglement clearly: Pinch and Trocco [48] argue that the Moog’s acceptance in popular music hinged on specific design choices like the volt-per-octave standard and the presence of a keyboard, while Pinch and Bijsterveld [49] show how live performance conventions mediated the reception of new technologies. These accounts suggest that instrumentality is shaped by design decisions, market logics, performance norms, and musical cultures that sit beyond the immediate DMI/player dyad.

In the remainder of the paper I therefore move from treating ‘becoming instrumental’ as a general slogan to operationalising it as a conceptual tool. I do so by introducing a set of loci of influence that help structure attention to the specific social, cultural, material, and commercial factors through which particular DMIs become, or fail to become, instrumental for particular people and communities.

## 4 An analytic exercise

In this section I propose an analytic exercise that uses a heuristic tool for identifying the factors that influence the process of a DMI becoming instrumental. The goal is to group overlapping influences into *loci of influence*. By naming and expanding these loci for a particular DMI, we can reason about how different factors contribute to its operational reality and how they interact, regardless of our personal evaluation of the technology’s ‘quality’.

### 4.1 A reflexive, non-evaluative process

This exercise requires the analyst to make explicit the factors they identify and to look beyond both the immediate user-device relationship and their own opinions of quality. It is inherently **reflexive**; because analyses are shaped by one’s own biases, cultural context, and theoretical leanings, different analysts will inevitably foreground different loci and read the same DMI differently. Rather than a flaw, this plurality is central to the method’s purpose. The locus-based view is not intended to produce a single, definitive account or a universal score for ‘quality’. Instead, it serves as a heuristic to orient attention toward latent, under-discussed factors and to structure comparison between different readings of the same DMI, or across radically different instruments. Its goal is not consensus on ‘goodness’ or ‘quality’ or any value factor, but rather aims to surface the objective forces that allow an instrument to operate in a specific cultural moment.

### 4.2 Loci of influence

The exercise invites the analyst to consider a DMI from several angles, identifying the social, cultural, material, and commercial forces that shape how and why it becomes instrumental. Each angle is a *locus of influence*. There is no prescriptive list; each instrument will have a different constellation of relevant factors, and different analysts will bring their own perspectives. However, the following categories offer a starting point for inquiry:

- **The performer.** The musician’s skills, public profile, and transferred knowledge.  
*Core Question:* How does the performer’s existing reputation or physical mastery validate the device as an instrument?
- **The intent.** The designer’s original goals and intended audience.  
*Core Question:* Who was this designed for, and how does that intended ‘user’ profile restrict or enable its social life?
- **The object.** Materiality, visual aesthetics, and what the form communicates.  
*Core Question:* What does the physical form communicate to the spectator about its status as a musical tool?
- **Technical aspects.** The role of underlying technology and its relationship to form.  
*Core Question:* How does the technical architecture enable (or hide) the ‘liveness’ and agency of the performer?
- **Cultural context.** Reputation, genre, and where the DMI has been used before.  
*Core Question:* What cultural associations or historical lineages are ‘imported’ when this technology is used?
- **Spectators.** Audience expectations; the perception of skill.  
*Core Question:* How is the ‘instrumental’ nature of the performance made legible (or obscured) for those watching?
- **Community of practice.** Who uses the DMI, existing conventions, and shared repertoire.  
*Core Question:* How does a shared vernacular or community consensus sustain the instrument over time?
- **Commercial factors.** Market success, availability, and the interplay of reputation and perception.  
*Core Question:* How does its status as a commercial product (or a rare research prototype) dictate its operational reach?

Separating these influences into loci not only can orient our perspective, but can expose new trajectories of critical discussion that stretch across drastically different instruments that may have

few (if any) physical, technological, or musical similarities, and yield surprising insights.

### 4.3 Derivation of the loci

The loci I propose did not emerge from a single empirical study or formal coding exercise, but from extended engagement with NIME practice: building and performing with DMIs, observing audience perception, and tracing how particular instruments circulate in different communities over time [3, 8–10, 43, 47]. They represent a synthesis of recurring questions from years of practice, such as ‘Who is playing this, for whom, and where?’, ‘How is it talked about, sold, or taught?’, and ‘Which parts of the system are visible, and which are taken for granted?’, coalesced into the categories listed above. While the framework is reflexive, the loci themselves are rooted in observable, objective forces: commercial availability is a fact; community size is a fact; cultural conventions are a fact; material form is a fact. The exercise simply structures these facts to reveal the latent conditions of instrumentality.

### 4.4 Relationship to existing frameworks

These are not simply idiosyncratic observations; these loci overlap with and synthesize existing frameworks in NIME and neighboring fields. This includes Magnusson’s ‘musical organics’ as a way of thinking about instrument ecologies [33], performance-ecology approaches that situate DMIs within networks of bodies, spaces, and media [35, 59], communities-of-practice perspectives on DMI communities [34], and critical work on the political and institutional conditions of NIME research [27]. Where those frameworks offer broad orientations, the loci are intended as a lightweight operational scaffold that practitioners and researchers can apply to specific DMIs. It is a way of asking which ‘zones of influence’ matter for a given instrument, and how they assert themselves in the real world.

Crucially, the loci are not meant to define a new ontology of instruments or to replace existing evaluative frameworks. They are deliberately loose categories that can be combined, ignored, or extended according to the DMI under discussion. Their value lies in making it easier to articulate the objective, contextual influences that many NIME practitioners already sense but which often remain latent because we have lacked the tools to capture them.

## 5 Case Study 1: Chaos Bells

Chaos Bells [40]<sup>1</sup> is a large-scale percussion DMI created by Lia Mice. It consists of a two-meter cubic frame with twenty hanging PVC pipes. It exists as a single artifact, tightly entangled with Mice’s performance practice and specific experimental scenes.

### 5.1 Applying the loci

Using the heuristic tool, we can identify which ‘zones of influence’ are doing the work of making this assemblage instrumental:

**5.1.1 Object.** The scale of Chaos Bells demands large, visually foregrounded gestures. Its metallic aesthetic and sculptural presence communicate to the spectator that this is a serious percussion tool, centring the object in the performance context.

**5.1.2 Technology.** Sensors feed a Karplus-Strong synthesis algorithm running on low-latency Bela systems. This technical

architecture is critical; it preserves the action-sound relationship expected of acoustic percussion [41], reinforcing its identity as a ‘real’ instrument through physical response.

**5.1.3 Performer and Spectators.** Instrumentality here is tied to the performer’s traversal of the frame. For audiences, the mapping is perceptually legible: large movements elicit large sounds. This visibility creates a sense of liveness that anchors its status as an instrument during the performance [8].

**5.1.4 Community and commercial factors.** Chaos Bells has no commercial pathway and a very limited community of practice (the creator and a few collaborators). In this case, these loci are shallow, showing that for a research-led DMI, instrumentality is realized through deep, narrow practice rather than broad adoption.

## 5.2 Emerging insight

For Chaos Bells, instrumentality is assembled through a **tight alignment of the Object, Technology, and Performer**. It proves that a DMI can operate as a compelling instrument without needing commercial success or a large community [52], provided the material and technical legibility is high enough to satisfy the expectations of the performance context.

## 6 Case Study 2: Max

Max<sup>2</sup> is a visual programming environment used for building interactive systems, widely used for signal processing, control, and prototyping in NIME and related communities [42]. Unlike Chaos Bells, it is intangible, often functioning as the invisible infrastructure behind a performance.

### 6.1 Applying the loci

The loci reveal a completely different constellation of influence, explaining how Max operates as an instrument despite lacking a stable physical object.

**6.1.1 Object.** In performance, Max most often appears as a laptop on a table. This lack of a standalone physical object complicates its status; it often relies on external controllers to be perceived as an instrument by spectators.

**6.1.2 Technology.** Max is built on a patching paradigm that allows for highly singular, custom-built behaviours. Its technical flexibility is a major factor in its uptake, but also makes it difficult to pin down as one specific kind of instrument [39].

**6.1.3 Performer and spectators.** The performer’s decisions, such as how much of the patch is exposed and which controllers are used, determine whether spectators perceive it as an instrument, a backend infrastructural technology, or something in between [22]. Effective performance often presupposes knowledge of DSP and workflows, making its instrumentality highly dependent on the performer’s skill and performative choices.

**6.1.4 Community of practice.** This is a deep locus for Max. Since the 1980s, it has been a staple in computer music education. Its presence in curricula means thousands of students are inducted into its use and conventions, creating a massive, global community that sustains its identity as a foundational musical tool [44].

<sup>1</sup><https://www.liamice.com/chaosbells>

<sup>2</sup><https://cycling74.com/products/max>

6.1.5 *Commercial factors.* Also a deep locus. Max is a mature commercial product with stable revenue, and its integration into Ableton Live via Max for Live has placed it in the hands of millions of mainstream producers. This commercial infrastructure underwrites its persistence in the world far more than any single 'good' design feature.

## 6.2 Emerging insight

For Max, instrumentality is contingent and distributed. Max becomes instrumental not through a singular object, but through community embedding, individual artistic choices in performance, and commercial ubiquity. While it may often be invisible on stage, its operational reality as an instrument is secured by its status in the classroom, in online communities, and the marketplace. This demonstrates how community and commerce can substitute for the lack of a traditional physical object in the assembly of an instrument.

## 7 Case Study 3: The MiMu Gloves

The MiMu Gloves<sup>3</sup> are sensor-laden wearable controllers designed to translate hand gestures into musical data. Unlike the self-contained Chaos Bells or the broad-purpose Max, the gloves form one part of a larger performance system that includes software, sound sources, and the performer's body [1].

### 7.1 Applying the loci

The loci highlight how professional endorsement and controlled visibility can substitute for broad community uptake in the assembly of an instrument.

7.1.1 *Object.* As physical artifacts, the gloves are visibly technological but worn on the body. Their design shifts the 'Locus of Object' away from a separate box and onto the performer's hands, making the technology inseparable from the human form [23].

7.1.2 *Technology.* The gloves provide high-resolution gestural data but are 'mute' without musician-defined mappings via Glover, the MiMu software for mapping gestural data to parameters in external software. Instrumentality here depends on the technical architecture's ability to bind embodied gesture to sound with low latency, reinforcing the perception of the hands as the instrument.

7.1.3 *Performer and Spectators.* This is a deep locus for the gloves. Their identity is inextricably linked to the virtuosity of high-profile practitioners like Imogen Heap. For spectators, the gloves make gestures conspicuous and legible at a coarse level (e.g., a clenched fist or a raised arm), even if the exact mappings remain opaque.

7.1.4 *Cultural context.* The gloves carry a star-power reputation. Their association with pop-icon performances (e.g., Ariana Grande [23]) creates a narrative of empowerment and magic that defines their status in the public eye.

7.1.5 *Community and commercial factors.* While the gloves are a commercial product, their high price and limited runs have kept the actual community of practitioners small. Instrumentality is therefore sustained more through polished media demonstrations and prestige than through the messy, ad-hoc, everyday use found in the Max community.

## 7.2 Emerging insight

For the MiMu Gloves, instrumentality is assembled through controlled visibility and professional endorsement. They demonstrate that a DMI can be recognized as a 'real' instrument globally, even if very few people have actually played one. Here, the Locus of Spectators and Commercial Factors (scarcity and prestige) do the heavy lifting, showing that instrumental status can be purchased through media narrative and narrative framing.

## 8 Discussion

The application of the loci to Chaos Bells, Max, and the MiMu Gloves demonstrates that instrumentality is not a binary state determined by a technical interface, but an assembly of forces that varies across different scales of technology.

### 8.1 Object and physicality

Chaos Bells and the MiMu Gloves foreground visible, situated objects that shape spectators' attention. Max, by contrast, has no stable physical presence beyond the laptop and whatever controllers are attached, and often operates as invisible infrastructure. This suggests that while an object can make a claim to instrumentality immediately legible, it is not a requirement, and that the influential factors likely lie in other other loci (such as community).

### 8.2 Gesture, liveness, and embodiment

Gesture and liveness play different roles across the cases. Chaos Bells tightly couples large gestures and percussive sound via low-latency sensing; the MiMu Gloves are mute without mappings, and their instrumentality depends on performers designing and repeating gestural vocabularies that audiences can learn to read; Max's gestural surface is whatever controllers or on-screen interactions performers adopt, from opaque laptop work to visible hardware control. This points to gesture as a locus that can anchor instrumentality, but only in conjunction with staging, context, and audience expectations.

### 8.3 Community, visibility, and professional practitioners

Community and visibility also diverge. Chaos Bells is tied to a small, expert circle; Max has a large but diffuse community in education and professional practice; the MiMu Gloves have few users but high symbolic presence through star practitioners and media narratives. Commercial trajectories further differentiate them: a non-commercial one-off (Chaos Bells), a mature commercial platform (Max), and a rare, expensive product (MiMu). These combinations show how different market and community configurations can amplify, diffuse, or constrain the ways a DMI becomes instrumental.

### 8.4 Commercial trajectories and scarcity

Commercial factors pull in different directions across the three examples. Chaos Bells is non-commercial and exists as a single artefact; its lack of a product trajectory limits wider uptake but frees it from user expectations and market logics. Max is a mature commercial product with stable revenue and integration into other platforms, which sustains a large ecosystem but often positions it as invisible infrastructure rather than as the focus of attention. The MiMu Gloves occupy an in-between position: intended as a product but kept rare and expensive, they accumulate

<sup>3</sup><https://mimugloves.com/>

prestige partly through scarcity and controlled presentation, with few opportunities for the messier, divergent uses that mass distribution brings. Here the loci of commercial factors and community of practice show how different market conditions can amplify, diffuse, or constrain the ways a DMI becomes instrumental.

### 8.5 The substitution of loci

The comparison reveals a substitution effect between different zones of influence. Where a DMI lacks a stable physical Object (as with Max), the Community of Practice and Commercial Factors can do the heavy lifting to secure its instrumental status. Conversely, where a DMI lacks a broad community (as with Chaos Bells), its status as an instrument is anchored by its material Object and the percussive legibility of its Technology. This suggests that there is no ‘correct’ way to build an instrument, only different ways that DMIs traverse the path to becoming instrumental.

### 8.6 Outcome

The value of the loci-of-influence exercise lies in making these configurations explicit. It shifts the question from a subjective ‘Is this a good instrument?’ to an objective ‘Through which loci, and for whom, does this become instrumental?’. By viewing Max, MiMu, and Chaos Bells through the same lens, we move beyond personal preference and toward an understanding of how DMIs actually operate in the world.

## 9 Conclusion

This paper has examined how the concept of ‘instrument’ functions within the NIME community. I have argued that instead of treating an instrument as a fixed technical category (an interface), we should understand instrumentality as an emergent, operational quality that arises from how a DMI is embedded in cultural, social, and commercial contexts [7, 24, 60].

To support this reframing, I proposed a reflexive analytic exercise based on loci of influence as a pragmatic scaffold for reflection, rather than a new ontology [27, 33, 34]. Applied even informally, these loci surface objective, contextual factors that typically sit outside the frame of technical descriptions or user-study-centered accounts. The three case studies, Chaos Bells, Max, and the MiMU Gloves, demonstrate how this exercise allows us to compare technologies with vastly different social trajectories on their own terms. Whether instrumentality is secured through material liveness, pedagogical ubiquity, or symbolic prestige, the framework reveals the objective forces that allow these DMIs to operate as instruments in the world.

For the NIME community, the contribution of this work is not a new set of metrics for ‘success’, nor is it a replacement for existing evaluative frameworks. Instead, it is a tool for structuring reflection on the actual social lives of our creations. Designers can use the loci to think through how a proposed instrument might live in the world beyond the lab or first performance; performers can use them to articulate why certain DMIs feel more or less ‘instrumental’ in their practice; researchers can use them as a starting point for more detailed empirical or historical studies. It encourages us to move beyond personal preference and constructed evaluative frameworks, and instead map the diverse ways that instrumentality is assembled. By focusing on the ‘I’ as Instrument with curiosity about how it becomes so, we can finally move beyond the narrow paradigm of the interface and fully engage with the cultural work that NIME practice performs.

## 10 Ethics statement

The research represented here presents no explicit or implicit ethical conflicts.

## 11 Acknowledgements

This work has evolved over several years. Thank you to all colleagues and collaborators who have provided illuminating insight, interesting conversations, and useful feedback.

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