Self-Sabotage Workshop: a starting point to unravel sabotaging of instruments as a design practice

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ABSTRACT

Within the music improvisation and jazz scenes, playing a wrong note may be seen as a source of creativity and novelty, where an initially undesired factor (the mistaken note) invites the musician to leverage their skills to transform it into new musical material. How does this idea, however, translate into more experimental scenes like NIME, where control and virtuosity are not necessarily the performance's aims? Moreover, within NIME communities the addition of randomness or constraints to musical instruments is often an intended aesthetic decision rather than a source of mistakes. To explore this contrast, we invited four NIME practitioners to participate in the Self-Sabotage Workshop, where each practitioner had to build their own sabotaging elements for their musical instruments and to give a short demonstration with them. We gathered participants' impressions of self-sabotating in a focus group, inquiring about control and musicality, and also the strategies they developed for coping with the self-sabotaged instruments. We discuss the emergent ideas of planned and unplanned sabotaging, and we propose a starting point towards the idea of self-sabotaging as a continuous design and musical process where designers/musicians try to overcome barriers that they impose upon themselves.

Author Keywords

Self-sabotage, workshop, control, mistakes

CCS Concepts

•Applied computing → Performing arts; •Human-centered computing → Empirical studies in HCI;

1. INTRODUCTION

Several well-known music improvisers and composers have developed strategies to get out from their usual comfort zone in what De Souza has called *voluntary self-sabotage* [11]. Renowned jazz guitarist Kurt Rosenwinkel, for example, retunes his guitar as a way of unlearning rehearsed patterns [11]. De Souza also cites John Cage's prepared piano where he adds screws and bolts to the strings so the results from musicians actions become unpredictable [11]. Hamilton [15] has referred to this attitude of openness to the uncertain as the *aesthetics of imperfection* - not to be confused with Cascone's *aesthetics of failure* [7], which focuses on the value of technological rather than human imperfections - where musicians are in a "constant striving for new contingencies to respond to" [15]. For the *imperfectionist*, mistakes and the moving out from usual patterns are embraced as a source of new materials [1, 15, 31]. As a famous quote attributed to Miles Davis says: "Do not fear mistakes - there are none" [1]. A wrong note is nothing but "a hole to play your way out of" [22].

However, terms like sabotaging, risk, errors and mistakes have a highly subjective character. The random retuning of a string, for example, could be seen as a negative obstruction for a standard jazz improviser, while it could be an intentional and desired technique for a free improviser for whom the pitch of sounds might not be that important. This is even more critical in emergent or experimental communities like NIME, where the aesthetic identities are not well-defined [28]. Moreover, loss of control or adding randomness is sometimes included as an intended aesthetic decision in NIME practice [37, 17, 4].

What does self-sabotage mean then for a NIME practitioner? Could self-sabotage bring new values and practices into the NIME arena or, rather, are these values already present in established NIME practices, only with different names? With these questions in mind we ran a *Self Sabotaging Workshop*, where we invited four NIME practitioners (the four participants were designers of instruments, music performers and have published in NIME) to design and build their own self-sabotaging elements and to provide a short improvised performance with them. The workshop included a focus group reflection where we collected the impressions of participants around the concepts of control, musicallity, and the strategies to cope with the self-sabotaging instruments.

In this paper, we begin by framing and motivating the spirit of the workshop through a review of previous sabotaging instruments which we define as any instrument that has been designed or modified with the aim of challenging musicians through unexpected or unfamiliar functioning. We then present the method and resulting self-sabotaging instruments of our workshop and discuss the creative struggle between human and technological factors present in the design and musical process. We provide a starting point for situating self-sabotaging as a design and musical practice that involves three main stages: (i) the drawing of practitioner-specific aesthetic and musical boundaries (the planning stage), (ii) a resulting network of interrelated human and material sabotaging factors (the implementation

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stage), and (iii) an openness towards coping both with the planned and unplanned sabotaging factors that emerge when interacting with the instrument (the musicking [34] stage).

2. RELATED WORK

De Souza [11] recognizes three categories of self-sabotaging strategies: (i) retuned instruments (e.g. moving a string to a new tuning as per Rosenwinkel), (ii) prepared instruments (e.g. adding objects in the sound production part of the instrument like Cage's screws and bolts in the piano), and (iii) redesigned instruments (directly modifying the body of the instrument) [11]. However, this categorization quickly becomes problematic in the context of new musical developments such as Digital Musical Instruments or Augmented Musical Instruments [26]. For instance, if we digitally remap the keys of an electronic piano so that it outputs guitar-like sounds, is this then a prepared piano or a retuned piano? (or maybe even a redesigned guitar?) We propose as a starting point the well-known distinction between the controller - the part of the instrument through which the musician interacts with it - and the sound synthesis - the part of the instrument that manipulates the signals and maps them into sounds [9] - as we find this distinction useful to structure our review of previous related work. To focus our review - and still keeping an open definition of self-sabotaging - we review works that explicitly look for an unfamiliar or unexpected interaction between the performer and the instrument - we call these cases simply *sabotaging* examples. In doing so we identify sabotage examples that relate to a wide range of concepts such as risk, constraints, intrusions, randomness, non-linearity and chaos, and errors.

2.1 Sabotaging the controller

2.1.1 Resizing the controller

The size of the controller shapes, to some extent, the size of the performer's gestures [2]. In this sense, resizing the instrument could be an intentional strategy to invite the performer for risky behaviour or even struggling to control. For example, in the *Absurd Hackathon* reported by Lepri et al [18], participants created the *Pipe Technology Project*, a magnified interface with 1.5 meter long sliders and knobs with 1 meter radius. As the creators commented, their aim was to emphasise the effort and the physicallity required by the controls, and to explore how this shapes the experience of performing. Similarly, Mice and McPherson [25] explore how large-scale instruments invite to highly embodied interactions and risky gestures.

2.1.2 Constraining the controller

While resizing relates to sabotage through risk and effort, constraining the controller could constitute a sabotaging because of gestural familiarity and expressivity.

Firstly, when constraining an already familiar instrument (for example, blocking some parts of the instrument), the main sabotaging factor is habits. As described by Martelloni et al with their wrapped guitar [20], constraining a familiar controller brings a "fight with muscle memory" when adapting to the new constraints, as the body keeps repeating learnt gestures that can be no longer useful.

Secondly, highly constrained interfaces could represent a sabotage in terms of the expressive possibilities of the performer. Gurevich et al [14] and also Zappi and McPherson [38] explored a one-button musical and low-dimensional interactive interfaces, respectively. Both studies found, perhaps counter-intuitively, that this seemingly sabotaging factor ended up leading to innovative and expressive interactions, with performers appropriating the instrument and finding a wide variety of hidden affordances - affordances that are discovered by the performers and that aren't expected from the design process [13].

There can also be constraints that go beyond the physical or mechanical modifications of the controller. Indeed, the instrument can provoke specific (e.g. risky) attitudes or dynamics through the imposing of specific rules for its manipulation. For example, Bin et al [3] designed Keppi, a digital music instrument that, if not moved enough, would stop working. Performers showed a positive response to the effort needed to make Keppi work, suggesting interesting guidelines for the design of challenging instruments [3].

2.2 Sabotaging the synthesis

The arbitrary mapping nature of DMIs allows to explore non-familiar [33, 32], random [10], chaotic [30], or unexpected outputs [18, 22]. We can trace this back to Waisvisz foundational "The Hands", where control inputs are at some moments transformed to wild and unexpected outputs [36].

More recently, non-linear and chaotic mappings have received particular attention - for example, Rob Hordijk's *Blippo Box* [16] or John Bowers *Fractal Knob* [5] and *Fucked Up MIDI Controller* [18] - because of their possibility of displaying a broad range of responses and surprising changes, yet still in a deterministic way [30]. For example, Mudd et al [30] developed and studied a series of interfaces that applied different non-linear mappings to the controls. Participants experienced what Mudd defines as "edge-like interactions", which means an engagement with the instrument through a compromise between surprise and control. It was found that musicians liked to be challenged and surprised by the sounds they obtained, leading to creative and explorative behavior.

Scott McLaughlin goes somewhat further away by remapping one music variable (time) into a different one (pitch). In his composition *Bifurcations in a Continuous System* [22] a professional pianist follows a score and plays a keyboard where the pitch of a note is derived not from which key was depressed but from the time duration between key-presses. Given the impossibility of performers following a perfectly constant tempo, the errors they made (the variations from the rule) mapped to unexpected new sounds.

Finally, although not strictly a remapping, feedback systems also offer non-linear and highly non predictable or controllable outputs [24, 8, 12]. Moreover, Melbye asserts that with his *Feedback-actuated Augmented Bass* the closed feedback system is not only disruptive or resistant, but it even displays a seemingly autonomous behaviour, raising questions about agency in performance [24].

3. SELF-SABOTAGE WORKSHOP

The instruments described above mostly involved sabotaging elements that a designer or composer externally imposed upon the performer, neglecting the highly subjective character of struggling, making errors, and sabotaging itself. Furthermore, these works usually focus on the instruments functionalities or the creative capabilities that they foster, but there's no exploration of the design process that led to the particular sabotaging elements. As a starting point to explore these intimate and highly subjective design and musical processes, we ran a *Self-Sabotage Workshop*, where we invited four NIME practitioners to participate in a 6-hours workshop in which they would develop their own sabotag-

ing devices. Instead of building final functional or highly engaging interfaces, the aim of the workshop was to explore the problematic, to examine the struggling that emerges from the sabotaging, focusing on the human and technological factors that interplay in both the design and musical process.

We sought for participants who practiced music improvisation and that were familiar with DIY/ maker processes (see Table 1). We contacted participants directly by email. All participants belonged to the Centre for Digital Music Research Centre at Queen Mary University of London

3.1 Preparation of projects

Two weeks before the workshop, we asked participants to fill in a design proposal for their self-sabotaging instruments. In the submission form we first explained what we understood by "self-sabotage" and gave some general guidance on how to think about the proposed design (see appendix A with the full form template). We asked them to briefly describe their proposed designs and include the materials they thought they would need. We asked them to work with their most familiar instrument used in their improvisation practice (Table 1).

3.2 Structure of the workshop

The workshop was held in the Centre for Digital Music in Queen Mary University of London and it was approved by the Ethics Committee of Queen Mary University of London. Participants signed a consent form for recording each part of the session and to publish it in a non-anonymous way, if necessary. Participants brought their own musical instruments. We asked them to bring the instrument they felt most comfortable with for improvising. They were given 5 hours to build their sabotaging device. We provided the materials required by participants (e.g. embedded hardware like Bela platform [23], electronic components, foam, acrylic, crafting and library materials, among others) plus extra materials that could lead to a more material-oriented practice [29] - we were open to the projects being modified by ideas *in situ*. After this, each participant was asked to give a short demonstration explaining their initial idea and how the building process unfolded, and to finish with a short performance with their sabotaged instrument (no more than 5 minutes) . We purposely restricted participants to a short amount of rehearsal time in order to foster the appearance of struggling and coping strategies during the performances, and to avoid them "hiding" the sabotaging element through practice. Finally, the group gathered for a 40-minute focus group where we asked them questions regarding their experience of building and using the sabotaging instrument, focusing on the level of control of the instrument and the strategies they developed to cope with it.

4. SELF-SABOTAGING INSTRUMENTS

Here we will describe the design process and the resulting sabotaging instrument for each participant, followed by a short description of their performances. Videos of the demonstrations (i.e. explanations + performances) are available from the workshop's website [1].

[1] https://teodannemann.wordpress.com/self-sabotage/

4.1 Random Cross-Fader by Jacob

Jacob brought his bass guitar, different effect pedals and his laptop for working with Pure Data [27]. His initial idea was to modify the pitch or timing of what was being played in the bass through a combination of software and effect pedals. However, as he said "then I realized that I had these really shh.....bad...pedals [laughs]". Jacob leveraged the "gnarly" nature of the pedals as a good source of self-sabotage. Then, he designed a cross-fader to combine the crunchy messy pedals with some other "nicer" pedals. The weight that was given to each of the two families of pedals was randomly allocated anytime the space bar of the laptop was pressed (see Figure 1). Jacob invited the audience - i.e. participants of the workshop - to press it whenever they wanted to, as a way of not having control over it.

Before starting the performance, Jacob noticed that there was a background noise he couldn't get rid of, even if using the "clean" pedals. In a jokingly way he commented that this is not important as having the broken pedals "it's going to sound horrible anyways".

During the performance, Jacob played long notes with the bass and he focused on fine tuning the sound through the pedals' knobs. The audience started interacting by single pressing the space bar, getting abrupt changes on the timbre and Jacob reacting to that through changing of bass fingering and knob tuning. Almost at the end of the performance, Juan approached the laptop and, instead of tapping the space bar, he grabbed the mouse pointer and directly manipulated the slider that controls the cross-fader, obtaining a smooth change of the sound - in contrast to Jacob's planned random jumps. Similarly, Andrea approached and started to quickly and continuously press the space bar. This led to the use of the space bar as an extra sound effect. Jacob positively engaged with this, nodding with his head and making eye contact with Andrea.

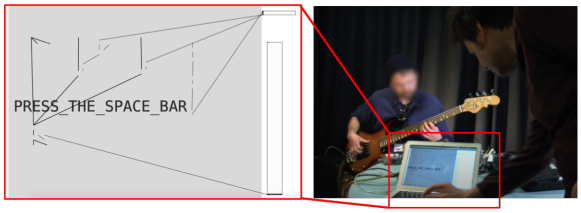

Figure 1: A Pure Data patch invited audience to randomize the parameters when pressing the space bar.

4.2 The Distant Cello by Nicole

Nicole is a classically trained cellist and multi-instrumentalist, and an experienced music performer. From Nicole's design proposal for the workshop:

> *I have the feeling that while improvising (or more specifically, when I am not reading music), I am more aware of the close connection of my body to the cello. My idea for a self-sabotaging device is quite simple - to disrupt/ break my bodily relationship with the instrument. I would place specially shaped objects in the the contact points between my body and the instrument (neck, chest, knees).*

She designed and built three foam pieces, one for the neck part and two for the knees (see Figure 2). Besides disrupting her connection with the cello, Nicole realized an unforeseen sabotaging factor: the neck piece would difficult the positioning of her left hand, as it would preclude the thumb

Participant	Music Instrument	DIY/Maker Expertise
Jacob	Bass	Design and build of digital musical instruments
Nicole	Cello	Acrylic-made cello/DIY experience for sound installations
Andrea	Electric guitar	Built an augmented guitar. Advanced knowledge in audio/sound software.
Juan	Electric guitar	Good experience with embedded software (Arduino, Bela)

Table 1: Participants music instruments and DIY background

touching the back of the cello's neck, which usually helps Nicole in terms of grounding and to "know where I am in terms of pitch". Nicole said she felt the cello "very weird" and "uncomfortable". She found her left hand especially unreliable as, in contrast to what she is used to, she had to think about the pitches that would be produced, and her hand would inevitably try to use the thumb as a pivot point.

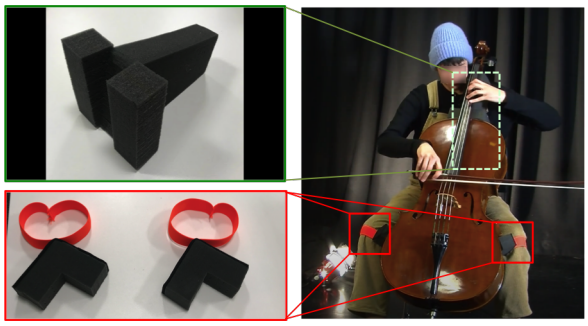

Figure 2: Foam shapes were created in order to detach the body from the cello thus losing the usual bodily connection and feedback processes.

During her performance, Nicole would relentlessly stop and comment on the difficulty she was having to get a proper sound from the cello. Her attitude - continuous laughter interspersed with sighs and puffs - shed light on her not engaging with the instrument (something she explicitly said at the end of the performance). Her attempts of making music narrowed down to simple diatonic scales and basic exercises, trying mostly to use the upper register of the cello, where Nicole commented it was easier to play because of the thumb not being blocked. Nicole said to feel a big lack of confidence with the instrument, and she jokingly ended the performance saying "can I take this out now, please?".

4.3 Drunken Attack by Andrea

Andrea is an experienced jazz acoustic/electric guitar player. In his proposal he refers to unintentional delay as the musician's nightmare, especially in the context of big bands. As he pointed out:

> *The inspiration came from the pain I felt playing for the first time after a long while in a big band. Missed or sloppy attacks really do stand out there, and you're usually incinerated by the MD Whiplash-style once you haven't been on point a few times.*

Andrea designed and developed a script in Bela [23] - see Figure 3 - that through short-term averaging of the guitar signal would detect attacks and then assign to the output signal's attacks a delay of random length (changing for every new attack). The result, as Andrea commented in the demonstration, was quite frustrating for him. For each attack one could hear a loud (and not planned) glitching sound, which was very upsetting for him. Besides, Andrea was unsure whether the obtained result was exactly what he wanted. In particular, he said that the randomness of the delay didn't sound like such. Instead, he felt that it was happening in certain fixed values.

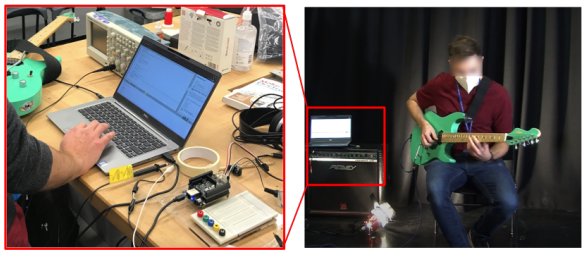

Figure 3: A Bela script adds random delay to each attack.

Andrea's performance was similar to Nicole's in the way that it was more a technical demonstration. Andrea decided to explore how the Drunken Attack would work when playing different styles: trying long chords, rapid riffs and scales, adding distortion, and using the vibrato bar. At the end he got into an even more experimental and he repeatedly played the same chord in a way of elucidating if the same action was leading to different (random) values for the delays or not.

4.4 The Moving Knob by Juan

Juan used a stepper motor for randomly move the volume knob of the electric guitar (see Figure 4 left side), so he would be constantly bothered by abrupt changes of volume (or even muting). However, an unforeseen thing happened: just before the performance the stepper motor failed. To compensate for this and to show a very basic idea of the device, he improvised a "Wizard of Oz" prototype [21] where one person would move the knob to try to replicate a random pattern whilst Juan was playing.

Juan started his performance by trying quick jazz arpeggios and scales. He was observed looking at how the knob was moving to try to adapt to it, but as soon as the knob would move to lower values most of the rapidly changing notes were completely muted. At some point Juan made a short pause and then he started playing long chords. As soon as this happened, he nodded in a kind of *eureka!* moment, while he commented: "this is a nice tremolo!".

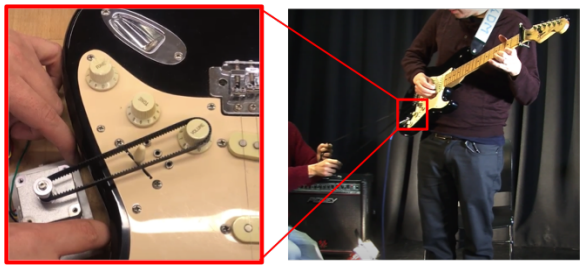

Figure 4: A stepper motor was supposed to randomly move the volume knob. As the mechanism broke for the performance, we used the Wizzard of Oz technique, with a human replacing the stepper motor.

Thenceforth, Juan kept long notes, interspersing chords with single strings plucks and arpeggios. The performance ended unexpectedly due to a final unforeseen element: the belt used for moving the knob came out and Juan is forced to end his performance.

5. FOCUS GROUP

5.1 Control and the role of randomness

When asked about the importance of keeping the control of their instruments, all four participants agreed that some control can be given away as long as they keep their ability to make something musical. Andrea commented that even in cases of substantial losing of control - like the one he experienced - you can still keep some musicality by, for instance, "drowning the sound in effects", to which Jacob added that this was precisely what he did with his Random Cross-Fader. Nicole said that with her sabotaged cello she felt a broken relationship and a complete inability to make music with it. She felt "a lack of control, but is not that this control was being taken by anything else".

At this point the conversation turned into discussing the role of randomness, a factor included for all the instruments excepting Nicole's.

Jacob started commenting about his combination of randomness with audience control:

> *I thought it was cool, I really enjoyed it...you can get really really self absorbed and is quite nice to have somebody just come and say 'do something different now'.*

Juan commented that this was also engaging for the audience:

> *I remember me changing stuff and you stopping what you were about to do, so it was very interactive.*

The inclusion of randomness for Andrea's Drunken Attack was quite contrasting with Jacob's case. He said:

> *Randomness didn't functionally mattered in my case. In the situation itself you don't really feel the randomness, because what you feel is a glitch.*

Finally, Juan commented that for his Moving Knob the effective result of randomness was a simple effect, a tremolo, that allowed him to adapt and respond to it, which made it engaging and fun for him. He ended up saying:

> *When you have a random element and then you want to adapt to that...that's when the creative stuff happens.*

5.2 Coping with the sabotaging

When asked about their strategies to cope with their sabotaged instruments, the following strategies were described:

5.2.1 *Ignore*

As can be seen in the first part of Andrea's demonstration video, he tries to play chords progressions or riffs completely as if the intrusion wouldn't exist. By ignoring the audio feedback, Andrea forgets about the musical output and focus on controlling the instrument as usual. As he commented:

> *I am a very bad musician when it comes to adapting to things, I tend to be incredibly stubborn, so one alternative for me was to play in the play-what-I-know mode, pretending that the thing [sabotaging element] isn't there.*

5.2.2 *Musical adaptation*

Nicole noted that her Distant Cello entailed physical constraints which at the same time imply musical suggestions on how to play the cello. The improviser can then react, adapt and use these suggestions as a creative material.

> *For example, I would be more tempted to play in the upper parts [higher pitch range] of the cello as they are not obstructed.*

Juan complemented that for his Moving Knob this was also the case:

> *The timbral space that I was presented by the effect made me adapt to it and use specific techniques that would work with it.*

5.2.3 *Compensation*

Andrea contrasted the musical adaptation strategy to a more rational endeavour: to study, understand the functioning of the instrument, and then develop techniques accordingly to compensate the sabotaging factor. Andrea emphasised the difference between this and musical adaptations, as the former

> *...it is not a musical endeavour, but an experimental endeavour. I just wanted to hear and understand what happened*

5.2.4 *Drowning it in effects*

Juan, referring to Andrea's Drunken Attack, put the question about the limits of the human capabilities to compensate or adapt to intrusions that are too difficult or chaotic to anticipate. Andrea responded with the strategy of drowning it in effects:

> *Well, in that case, you can always drown it in effects. I tried to do that but the glitch was making it worse.*

6. DISCUSSION

As an exploratory workshop we want to start a wider discussion about self-sabotaging as a design practice, rather than aiming to generalize our findings into design ideas. Moreover, it is important to see how self-sabotaging overlaps - and also differs - with NIME-related practices and values such as "Bent by Design" [16], control and agency shift [5], ambiguity [35], and surprise [30], among others.

In order to do so, we structure our discussion into the three stages of the workshop: the planning, the implementation and the musicking [34].

6.1 Planning: Self-Sabotaging as setting of boundaries

When our participants planned their specific sabotaging ideas, we note deep aesthetic values and identities coming into play: Andrea's struggling with note timing in a big band, Nicole's bodily relationship with her cello; Jacob's focus on keeping musicality even when playing with faulty equipment. This bringing of designers' identities into their designs has already been pointed out within the NIME (and broader design) contexts [6, 19]. However, self-sabotaging goes somewhat further as it calls for an overt breaking of (some of) these values. This implies the dissolving of aesthetic boundaries or drawing of new ones. For instance, Jacob's main plan was to include new musicalities (i.e. the crunchy pedals) that he wouldn't allow himself to include in a formal performance. Andrea's case is similar: he would try something that, by definition, would be his nemesis in a big band concert. As we can see, the self-Sabotaging plan is opening not only for developing new instruments, but also to imagine new scenarios and contexts. Of course intention is crucial here. Self-sabotaging means an intention of walking towards struggling points, but at the same time without failing or making the fool of ourselves (unless this is the intention!). This contrast between failed and successful self-sabotaging resembles Bertinetto's contrast between mistakes and novelty [1]. A mistake, says Bertinetto, is the breaking of a specific aesthetic normative without helping to propose new normative conditions. If we, instead, break a norm with an intention or proposition of a new norm, then this can lead to novelty or creativity, rather than just a mistake. Self-sabotaging does not mean to break the performer-instrument relationship. Rather, the aim is to intentionally intrude on this relationship to allow for the exploration of new boundaries.

6.2 Implementing: Self-Sabotaging as a network of human-material factors

Each one of the resulting instruments, as summarised in Table 2, is not only one but a combination of several "sabotaging factors" - elements that appear to intrude the previously familiar relationship. Let's take Jacob's example. First, there's the broken pedals. For Jacob, the pedals are a sabotaging factor because they bring forth "gnarly" sounds and timbres. Secondly, there is the inclusion of a random function that picks a combination of the nice and broken pedals. This is a sabotaging factor for a different reason: it takes out control from Jacob over which specific sounds he will get. Thirdly, Jacob allows the audience to tap and change the sounds, therefore sabotaging the control of when the sound will change.

This entangled character of sabotaging factors emphasises the fact that the function, value and meaning of a specific sabotaging factor is nothing *per se*, but it only gets meaning by how it is embedded within this network. Randomness, for instance, accomplished very different functions in the three cases it was used, as described in section 5.1.

6.3 Musicking: Self-Sabotaging as a planned openness to the unplanned

In contrast to randomness and other planned sabotaging factors, when playing the instruments, several unplanned factors came into play (see Table 2 fourth column). The effect of each one was quite different. For example, Juan grabbing the mouse instead of using the space bar was positively received and reported as engaging for Jacob. On the other hand, Andrea's glitch or Nicole's precluded thumb were frustrating as these sabotaging factors overshadowed the rest, making it impossible to use any of the strategies described in section 5.2.

This stage brings forth again the intention, but now in a different way. The key point is how to musically make sense of the resulting self-sabotaging instrument, either if it is slightly hindered or completely broken. The self-sabotaging practitioner is called to leverage both performer and designer skills to use the planned (intended) sabotaging factors, but also to cope or even embrace the unplanned ones as raw materials. Although the strategies described in section 5.2 were mostly musical responses, we can consider extending towards design strategies. For example, drowning in effects could be seen as a design strategy whenever controlling the instrument gets humanly impossible, as noted by Andrea.

6.4 Future perspectives for self-sabotaging

As a final point, we borrow Andrea's final assertion regarding his need of more time to build a relationship with the self-sabotaging instrument:

> *I see sabotaging as a continuous process with us trying to overcome the problems we put to ourselves.*

The rapid prototyping character of our workshop hindered the possibilities of any further iterations. We foresee that through new iterations self-sabotaging practitioners could seek a balance between disruption and familiarity, something akin to what Mudd et al refer as edge-like interactions for the particular case of control [30]. For example, as a speculation, we imagine two modifications or extensions to the cases of our workshop that could help to achieve this balance through the paradoxical idea of a "controlled intrusion". For instance:

- For Nicole: Instead of fixed foam pieces for the cello, pieces that change their shape, so performers could move from an "infinitesimal intrusion" and slightly make them grow to more disruptive intrusions.
- For Andrea: A random delay with a maximum value of t milliseconds, where t can be controlled by an expression pedal. In this way, a guitar player can start with no delay and then slightly and continuously increase the value of t through the pedal, so they are able to familiarize (at least partially, because it will always have randomness) to this increasing intrusion.

Participant	Sabotaging Factor	What is being sabotaged?	Planned?
Jacob	Broken Pedals	Clean sound	Yes
	Audience actions	Control of timbre dynamics	Yes
	Random value	Control of timbre	Yes
	Background noise	Clean sound	No
	Juan grabbing mouse	Random value	No
Nicole	Losing haptic feedback	Connection with instrument	Yes
	Change in posture	Instrument transparency	Yes
	Thumb precluded	Pitch accuracy	No
	Thumb precluding	Strength for pressing strings	No
Andrea	Delay	Time accuracy	Yes
	Random value	Control on delay	Yes
	Glitch	Clean sounds	No
	Doubt about code effectiveness	Learnability	No
Juan	Random motor	Volume control	Yes
	Broken motor	Functional prototype	No
	Non-random human factor	Random value	No
	Belt comes out	Continuity of performance	No

Table 2: Decomposing each self-sabotaging instrument into a series of planned and unplanned factors

7. CONCLUSIONS

In this paper we reported the results of our Self-Sabotage Workshop, where 4 NIME practitioners modified their instruments in order to intrude on their usual practice. Reflecting on the instruments and the focus group results, we drew a line between self-sabotage and other NIME-related concepts as randomness, lose of control and failure. Firstly, we distinguish self-sabotaging as an intention, a design practice that queries the practitioner about their aesthetic boundaries and values. What to break and how to break varies abruptly between each practitioner. Secondly, self-sabotage implies an encounter between the planned and the unplanned. The planned part refers to the original design: random functions, material obstructions, an intentional delay. The unplanned part regards the material response when musicking: gestures that become difficult or impossible, unplanned glitches or bugs in the code, among others.

We suggest that a successful self-sabotaging practice must entail (i) For the planned part, a skillful design process that aims to find the balance between familiarity and instrusion for that particular music practitioner (i.e. themselves). (ii) For the unplanned part, we need a skillful musician that can develop strategies (e.g. compensation, adaptations, or even ignoring) to cope with the unplanned factors, so that they are able to retain musicality. We speculate that more iterations should be offered to find a balance between the design challenges and the musicians' skills.

Ethical Standards

The data, audio and video recordings during the workshop was approved by the Queen Mary University of London Research Ethics Committee and consent by participants.

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APPENDIX

A. WORKSHOP STRUCTURE

The following is the invitation and guidance text provided to the designers.

- *Workshop Date: 11 December 2021, 10:00-15:00*
- *Location: Queen Mary, University of London*
- *Description: in this workshop we will explore what happens when we try to self-sabotage our music performances, and what this can bring of new in the context of music improvisation. We will collaborate to design and build artifacts that will be embedded in your usual individual improvisation practice, and explore what new kinds of interactions they can bring. We invite ALL KINDS of music improvisers: free impro, jazz impro,*

electronic and DMI impro, experimental, live coding, fusion, among others. The only requirement is that you are familiar and comfortable with individual music improvisation with your instrument.

- *Proposal guideline: For your proposal, think of either a physical artifact or an electronic device that you will build in the workshop to use in your improvisation practice. This device has to be an intrusive element, something that is not only new but that also provoke some dislocation, disturbance in your practice. Obviously, it doesn't have to be too disruptive that precludes your performance. Think of a tiny disturbance, something that may take you out of your usual interaction with the instrument. To give you some ideas, notice that you can mainly go two paths:*

  1. *To modify the gesture/physical space: this includes modification of size, weights, shape of any of the elements you use (bow, hands, picks, sticks, etc). Yo can also add new degrees of freedom, like rotations, translation or vibration of elements. Also you can constraint the physical interaction (for example, tying up fingers, adding stiffness or physical effort to specific movements, blocking some parts of the instrument).*
  2. *To modify the mapping of sounds: As we get familiar with our instrument, we naturalize the mapping of a specific gesture to a specific sound. What happens when this connection is broken? The most basic example of this is when we try an unfamiliar new tuning in a string instrument. For digital instruments this brings special opportunities, as we can remap (through MIDI or OSC protocols) the gesture sound relationship as we like. Some ideas could be to add random values to the output notes, or remapping some specific keys of a MIDI controller, but the possibilities are infinite!*