



# DMIs AMONG THE OTHERS – Live at the Concert Hall

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## Abstract

In this paper we propose ways to promote the use of specific Digital Musical Instruments (DMIs)<sup>1</sup> in live performance situations. Some of these instruments (DMIs) are usually conceived as personal objects, adapted to precisely instrumental techniques or as expositive artwork such as sound and multimedia installations. To make this possible, it is necessary that composition paradigms includes, from the very beginning, integration strategies of DMIs together with traditional instruments and groups (ensembles, orchestras, etc.).

The regular presence of DMIs on stage with traditional musical instruments, could lead to new aesthetical dimensions of music and a new compositional and performance paradigms in the framework of contemporary music. The emergence of these instruments and their integration with traditional instruments in musical contexts, will also lead to new dimensions of DMIs design. Our research in the framework of DMIs prototypes is strongly concerned by all these premises and we hope to contribute to the development of new compositional paradigms and some instrumental techniques. This paper presents our vision concerning the DMIs and their role in the musical environment and in musical history.

## Keywords

DMIs, Families of Instruments, New Models of Musical Composition, New Sounds, Hybrid Projects, Musical Performance.

## Introduction

Nowadays we are still living in a period of historical excellence for the New Music and Sound Art. Like in the past, scientific discoveries and new technologies allow musicians to free themselves from traditional methods of creation, enabling them to participate in interdisciplinary teams of artistic production.

Apart from the desire of creation and the discovery of new sounds and timbres, we found as well other motivations connected with the development of new musical instruments. These are for example, the instrument conversion in

a personal interface or group interaction interface and collective musical expression. [2]

Many authors have already explored different themes concerning the DMIs, such as their different needs/liberties linked to music, used technologies, or their design as a musical instrument. However, it is fundamental to focus in a discussion on how to give continuity to the potential of the recent and old DMIs that are presented to the academic community and how we can get an appropriated composition models for them.

In furthering this subject, we consider important for composers, without previously contact with specific DMIs, to be able to understand the specificity of some instrumental techniques related to DMIs, and at same time be skilled to compose for them in the same way that they composes to traditional musical instruments.

In fact, the separation between composing to DMIs and playing DMIs could increment the musical production and, as consequence, can easily generate new opportunities to bring these instruments to the concert situation.

This perspective will open new opportunities to instrumentalists with classic training, to play more and more the DMIs, because someone has already understood the influence of extended techniques applied to their instruments.

Based on these principles (articulation of extended techniques on the traditional instruments) they can reach new sounds and they will be capable to learn how to play new digital instruments.

Both, the experimentation and innovation are the most important challenges in music history. The tradition was perpetuated by artistic heritage, the transmission of knowledge and aesthetic opinions. The music has survived through the centuries, thanks not only to the permanence of their own rules, but as well, because of a shared conscience of its own necessary recreation. Stravinsky summarized in a single sentence this idea: “we have a duty toward music, namely, to invent it”. [3]

The New Musical Interfaces including the DMIs are responsible for shaping the music of the future, and not only be played with improvisation parts. [4]

Performance and Composition are both themes connected to the general universe of the DMIs. It is in situations of installation focused on the idea of public art or stage, that we can take advantage of the novelty and potentialities of these new instruments.

<sup>1</sup> Digital musical instruments (DMIs) are musical interfaces focused on musical instruments that use the computer as the main device to create sound. A gesture controller that leads the musical parameters of sound synthesis in real time mostly sets up these instruments. [1]

Some authors have been referring the need of developing DMIs with a more robust construction and with a learning technique, so that with these adjustments they keep having an historic continuity. [5] [6]

These Digital Instruments arise to counteract the amount of learning time for traditional musical instruments, which are not easy to learn. However it is important to have a balance between an easy-to-use interface and continuous musical evolution, achieved by long hours of training with the instrument to reach their maximum potential in terms of creating unique sounds. [7]

Taking in consideration the new possibilities of musical creations with DMIs, and the importance of the cooperation between the different disciplines on sharing concepts and vocabulary, and all the hybrid practices in the arts and technology, we are able to affirm that the DMIs are hybrid musical instruments.

We reflect on the impact caused by interdisciplinary work and how composers and creators, who worked in key hybrid projects, came to be extremely important. They re-wrote not only the history of music, but also the definition of art itself influencing the contemporary art projects, namely the Digital Musical Instruments (DMIs).

### **Do It Yourself - An Academic Perspective**

An important incentive for the fulfilment of our research is the presence of a large number of academic works and a reckoning of active students and participants in an emergent artist and social community Do It Yourself (DIY) and DMI.

The emergence of new technological crafts for musical and artistic proposals brings new approaches to *sound art*, extending the study field of an instrument to become necessary rethinking the definition of instrument, music, concert and musical composition.

Musical devices can take diverse systems, including interactive installations, digital musical instruments, and augmented instruments. [8]

Nowadays, there's a lot happening inside the DMIs community. This is not only related with technological changes, but also with a series of transformations that cause changes in the musical approaches in the way we see music. The main change factor is the easiness in sharing information on the internet, leading a lot of people to recreate *sound toys*, sound generators, tools for musical creation and even DMIs, participating in blogs, taking part of the DIY culture, and using Open Source software.

With all this action happening, these changes became more current and will continue to challenge the meanings of artist, composer, performer and participant in this musical and technological context. [9]

The definition of instrument did not change as the definition of music. Its significance was questioned and re-fitted to new situations only with the introduction of electronic instruments and computers. [10] A new instrument or a DMI only acquires the status of a complete musical instrument when it gains historical and technical contextual-

ization. [11] However, this is a topic that remains constantly changing. No traditional art has been so agitated in its essence, practice models and communication by the new media and recording technologies, retransmission and synthesis as music. [12]

When we approach this question of DIY culture and the existing facility to access tools for musical creation, we must assume that it exists not only for creative artists, but also, and mostly for users of their personal interactive objects.

The construction of DMIs, the interface design, sound synthesis in real time, new practices for musical composition, and existing models of improvisation (based in computers, or not) may actually lead to a new model for musical interfaces. [13]

These concepts are still the source of current studies, and are strong pillars to define new DMIs - whether they are conceived to specialized public, like artists and musicians, or to the general public, without musical training.

When we talk about the relationship between DMIs and musical composition, even more associated to the academic and DIY communities, it is essential to clarify that musical interfaces are not a DMIs or musical instruments.

In this context is capital to establish a kind of transition between these two instances (musical interface and DMI).

The DMIs had a great expression in the 90's and the early 2000s, but they still continue to exist for mainly two reasons: the sake of performance and a freer musical composition, indeterminate and experimental. However, if we want that DMIs find their place on stage alongside other instruments, it is important to understand the compositional and performance paradigms for DMIs.

### **From Experimentation to Composition**

For centuries western music saw music as tonal, composed by notes and forgetting what was inside or behind them. [4] While there were composers in the beginning of the last century that broke these patterns of thought (e.g. Stravinsky) the change was slow. However, we have already seen more than half a century of computer music that made music reborn completely, not only at the technical level as well as aesthetically.<sup>2</sup> [14]

The twentieth century brought free systems for musical composition and new techniques for playing traditional musical instruments, whose principal body was the sound character, the timbre, and not only formal aspect of the musical structures or the composition of rhythmic and melodic elements, as had happened before.

This change will open the ways to write music, even though the traditional methods have already changed. New forms of musical notation were always discussed, and received special attention from contemporary composers of the last century, resulting in the development of new systems and the appearance of new symbols. [15]

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<sup>2</sup> Stockhausen and Maconie, *Stockhausen On Music*.

The music has a natural tradition regarding its relationship with collaboration and socialization. The DMIs have sought to evaluate systems for multi-user's thinking of composition/interaction models for sound installations, under the compromise of searching the simplicity of interface given the complexity of the musical results. However, these ideas can be transported to concert situations with interpretation of pieces written for DMIs, always thinking about the role of composer and performer exploring the compositional characteristics linked to new sounds and concepts from digital technologies, believing it is here that provides consequences for the music of the future. Nevertheless, it has not been an easy road for composers – thinkers, who took electronic music as a break required to classical music, because initially these two genres did not mix together. Only later, during the 70s, with Stockhausen, ideas proved the opposite. From then composers could compose both orchestral and electronic music, and even combine the two genres in the same musical piece. [14], [16]

### Ensemble Music Featuring DMIs

Contemporary music and musicians are no more than the continuation of an important tradition: the classical music. For Manoury, new technologies and the latest developments at the technical level of traditional musical instruments and of the design of new instruments are not as surprising if we consider these events in a greater reality. They are only the perpetuation of a knitted history jointly made through news, research, experiments and memory. [3]

For example, ensemble music already combines acoustic instruments with digital instruments, with computer music and electroacoustic music in concerts programs for new music. However, adding DMIs to these new ensembles creates some difficulties for composers by obvious limits associated with the techniques of playing and composing for these new digital instruments, as mentioned.

There are not many composers that compose for traditional instruments and program the electronics for their electroacoustic pieces. In fact, many composers usually ask to software designers or software developers. In contemporary music written for ensembles of traditional instruments, it has been a while since traditional instruments won a new expression for the way they have been explored in terms of implementing techniques by the electronic addition or even the visuals. Nevertheless, we will focus only on the sound part.

When the computer has earned a place in music and joined the traditional musical instruments, most of the time and currently, this is a sound presence / acoustic / spatial and not physical. In fact, the computer had difficulty finding their place on stage in performances as a tool, but less as an object. [11]

A major criticism drafted to electronic music was based on its lack of expressiveness. To counteract this, many works have been made to create software and DMIs to convey this missing emotion. That's why the gesture control and

*mapping* are so important in the development of DMIs. [5], [17] This way, composers and musicians could benefit from creating and synthesizing their own sounds for their compositions and performances. However, there's a big gap to be filled: there's no musical training regarding DMIs. Some programs must be implemented, providing, composers and musicians, enough skills in instrumental techniques so they can explore satisfactorily these new instruments. It is also important to promote propitious environments - such as improvisation sessions - where musicians shall be able to experience freely DMIs, understanding both sides strengths and weaknesses. [18]

The examples of DMIs that we want to see on stage and in new ensembles, and which we propose with this paper, are those that can help to solve the lack of expression still present in electroacoustic music, bridging the still existing need, mainly from the audience, to add a musical instrument – an object to the sound that most still do not understand but already know it as digital. Therefore, it can be argued that we are in a transitional phase.

### Conclusion

Interfaces and technologies present several additional difficulties, and so, both composers and performers must deal with them carefully.

An interface is not only a controller; it is also a barrier and a resistance factor that needs to be overcome. However, there have been new interfaces for music that express the sound and musical aesthetic needs, that so often composers seek for their works and do not find in traditional instruments.

We hope to continue our work producing new prototypes that can, with their new models of composition, help to break with the past and make that contemporary music lives a new paradigm. Only with the hands on experimentation is possible to discover and contribute for new music technology.

In fact, it was not yet possible to find a synthesizer in the normal *lineup* of a symphony orchestra, although pop music uses them to imitate the sound of traditional musical instruments present in orchestras. [14] The grow up process of DMIs performance and the incrementation of DMIs among other traditional musical instruments “on the stage” strongly depends on new musical composition paradigms, were the balance between the aesthetical dimension of noise and sound, must be complemented.

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