bass by developing a proposal for its harmonic use. Organologically classified as melodic, the instrument has tonal and ergonomic characteristics that enhance its use beyond this designation. In this perspective, an increasing number of bass players are looking to use the electric bass as a harmonic instrument; however, the lack of research on this approach hinders its development. Based on an alternative tonal system to consolidated practice, called LCCTO (Russell, 2001) and guided by a research design structured according to the concept of Affordances (Gibson, 1977) and on the theory called Perceptual Learning (Gibson & Pick, 2000), the investigation seeks, through experimentation, (i) the definition of a harmonic vocabulary for the electric bass and (ii) the creation of musical works from this vocabulary. The result of this work is intended to contribute to the construction of a new paradigm for the practice of the instrument, for the academic discussion about it and, consequently, will bring pedagogical implications.

The results achieved so far point positively to the potential of the electric bass for the development of a, here called, Harmonic Approach to the Electric Bass. The concluded experiments already provided a number of 1153 viable possibilities for playing chords on the instrument, which have been organized in the form of a dictionary, as well as extensive material resulting from the articulations (simultaneous execution) between these chords and the different scales proposed in the LCCTO. The material resulting from the experiments also included the "Creative Applications", organized in the form of studies and that reflect, through composition, the musical use of the obtained contents.

Keywords: Artistic research; Affordances; Electric Bass; Experimentation; Harmonic approach; LCCTO; Perceptual learning

Slippery Singularity Studies: Multidimensional performance as creation

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The intertwining of computation with artistic environments leads to a state of permanent articulation and supports the development of

artistic creation. We are immersed in computation, living in a post-humanistic and post-digital world, in which it becomes fundamental to artistic practice, to artworks, and the aesthetic experience. Since the close of the twentieth century, there has been an outbreak of musical genres and musical expressions according to two principles: the integration of tradition and technological means; and the rupture of all the contexts that cannot be seen as directly deriving from the computer and digital technology. This means that the creation process trajectory goes from concrete realities towards an external space, based upon an understanding of the adaptation of the technical and technological realities to the needs of creation, while the creation process relies on an awareness of the technological potentialities as a means to attain an artistic result. *Slippery Singularity Studies* belongs to a series of pieces for multiple saxophones. These pieces were developed over the specialized algorithmic composition software named Slippery Chicken, which is written in and functions on the principles of the Common Lisp Object System (CLOS), the Common Lisp facility for object-oriented programming. These pieces for saxophone and electronics explore microtonal relations of tone pitches and layers of multiphonics permutations. The multiphonics were organised into layers of *tremoli*, producing timbral changes, and were selected through a process that uses two different methods and software. The first method was implemented through a patch named SaxMultis and allows the recording of all multiphonic timbral permutations and its cataloguing. It provides, as well, the possibility of random positions of key combinations for saxophone sounds. This software is organized in the following order: Selection of Key Position, Position of Tremolo, Indication of Dynamics, Creation of Buffer with positions code, Recording. The second method, Multi2Chord, is a software as well, which analyses the spectrum of each multiphonic permutation and translates it to musical notation using ZSA and BACH Max/MSP Libraries. Technology is moving faster than musical practices and we are taking some snapshots of techniques applied in musical composition and performance, techniques whose materialities will be quickly replaced by new ones, but whose embodied structures continue and become re-implemented in later technical objects as a recycling of skills. Understanding how emerging digital musical technologies trace their concepts, design and functionality to practices in the current cultural context will bring to light a study of new-media archaeology, conceptual epistles and performative

paradigms, directed, in other words, to the study of how the new technologies of mixed music-making trace their design to the practices of material, symbolic, signal inscription and how practice is transforming and leading to creation.

The two traditions of 'Experimental Music': Implications for the later conceptual history

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There are two traditions of musical work which have laid claim to the term 'experimental music'. The first is today perhaps the most familiar, referring to the work of John Cage and other composers associated with the 'New York School', with precedents in the works of Charles Ives, Henry Cowell, and Harry Partch, then feeding into a range of other work in North America, Europe and further afield. Such a tradition refers to a new approach to compositional intention, the use of indeterminacy of various types, and a general rejection of a role for the composer which is said to date back to the European Renaissance. This tradition was given its clearest conceptual definition in Michael Nyman's 1974 book *Experimental Music: Cage and Beyond*, which consolidated a quite stark dichotomy between the 'experimental' and the 'avant-garde', which continues to inform a good deal of historiography of twentieth and twenty-first century music. The second derives from Pierre Schaeffers' lecture 'Vers un musique expérimentale' given in Paris in 1953, and refers to music produced in a laboratory or equivalent, especially involving electronics, tape or computers, used in various ways that can be compared to scientific experiments. It was taken up by figures such as Lejaren Hiller, Abraham Antoine Moles, Luigi Rognoni, and others, but also employed in writings of Herbert Eimert, Luciano Berio, Luigi Nono, Karlheinz Stockhausen and Henri Pousseur, and continued in continental Europe for several decades.

In this paper, I give a brief outline of these two conceptual histories, and consider how both have fed into more recent use of the terms 'experimental' and 'experimentation' in music. I argue for greater