Chapter 6
Reconstructing Digitally Instruments and Scales in the Synchrony and Diachrony of Music

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ABSTRACT

The capabilities of modern computers to visualize in a realistic and constructive manner how ancient musical instruments performed gives contemporary musicologists an unprecedented insight on how music evolved through the centuries. Collecting evidence from museological exhibits, reconstructed physical instruments from antiquity have been performing around the globe. Based on these, Computer Music scientists create virtual environments that allow experts to experiment and interface with cultural worlds that flawlessly revive the timeline of music through the centuries. Even further, computer systems can synthesize melodies based on the notation used in antiquity, providing scholars with a vivid reflection that echoes humanity’s collective memory through the centuries.

INTRODUCTION

The Musical diachrony and synchrony has revealed an incredible variation in musical scales and hearings, many of which are implied, lurking in traditional patterns and not adequately transcribed in their projection to the dominant Western music predicates. For the first time, due to virtualization platforms, like YouTube, Rhapsody and iTunes, we can have a global view of the music scene in terms of geographical dispersion and historical depth. I.e. we can see instruments, music forms, and choral songs in numbers surpassing human comprehension. Moreover, many of these instruments have such a long history, that they carry speckles from worlds that have long ceased to exist. These remnants not only stigmatize (in a positive sense) the evolutionary process of instrumentation, but also bear clues for reconstructive musicality for what music was, is and will be. For instance, a Stradivarius' violin is a milestone for our

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comprehension of the technical complexity, acoustic perception and after all applied music quintessence for the musical professionalism of that era. It is the tools of the trade after all that make the masters, and the masters were the middlemen for leading classic music to the unprecedented heights of artistic perfection, in terms of beauty, emotional power and intellectualty.

It is evident that every nation perceives its own music, or the music of the ethnic group it belongs to, better than the other ones. There seem to be characteristics in the music styles, linguistic forms and aural dynamics that morph the intuitive understanding and insight of the ethnic music scene.

Thus, we talk about music traditions linked with languages and people, persistent for centuries or even millennia, historical events and esoteric class metamorphoses, cultural and social diagnoses that shape drastically a space of influence. We talk more about music cultures than ethnic schools for music; these cultures cast music spheres with different mentality than the predominant Western music paradigm, which is based essentially on a Latinized musical and linguistic substrate for North-Western more, instruments of these eras. Right, I view in terms of synurnal more, instruments of these eras. Right, I view in terms of synurnal European acme and expansion, including its Northern American offspring.

It is obvious that predominant music paradigms shape the global music scene; even further, technological advances foster pioneer species, as is the case of “techno” and “house” music, which has caught up the 21st century global music as a pleasant surprise.

In this highly parameterized scene, computers and intelligent devices make their entry in a fashionable and trendy manner. They offer advanced usability for simulating instruments, sounds and performance characteristics. The term usability refers to the ability of a product used by specific individuals with specific targets under certain circumstances to be effective, efficient, and provide subjective satisfaction to users.

In this article, musical interfaces used on computers or mobile devices are analyzed. These interfaces are the result of the enormous technological development in the last few decades in the field of multimedia reproduction and communication, and affect the field of musicology, computer music and of course the mobile industry (Margounakis & Politis, 2013).

The contribution of these interfaces lies not only in their recreational ability to deploy instruments that otherwise would be placed in the unpenetratable worlds of museum show cases or isolated institute wards. Furthermore, they can recreate musicalities from different worlds, unusual music systems and dissimilar semantics to the Common Music Notation of staff music.

Therefore, not only qualitative differences (i.e. having to do with the specific sound quality or timbre that acoustic instruments of another era produced) but also quantitative differences arise as the intervals used in antiquity were significantly different in comparison to the ones that Western music is using.

Such a system is the one of Byzantine Music. It is not different only in terms of semantics (it is a Delta notation system – see Politis, Linardis and Tsoukalas, 1996) but also it implies different scales, alterations and accents that have been historically in use for more than a 1000 years in their present form.

Byzantine chants contain certain intervals, accidentals, and tonal attractions which result in pitches that do not exist on the equally tempered keyboard, the standard for pitch relationships in contemporary Western compositions. These subtle differences add a unique beauty to BM melodies. Although there was a tendency to consider these differences of minor significance for transcription to the CMN corpus (Wellesz, 1958) recent advances in computer music reproduction schemes pose the need for a detailed and documented incorporation of these attributes to the digital interfaces of contemporary instrumentation.
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