EDITORIAL

This issue of *Organised Sound* focuses on mapping in computer music. Unlike many issues of the journal, all articles in this edition are related to the theme. The call for contributions resulted in a significant collection of work which covered a broad range of activity in the field. This number of articles would normally fill more than one issue of the journal but we decided to keep the collection together as a representative body of work.

We were delighted to welcome Marcelo Wanderley as Guest Editor for this issue. I would like to thank him for his hard and diligent work throughout the preparation of this issue.

Tony Myatt

MAPPING STRATEGIES IN REALTIME COMPUTER MUSIC

Traditionally the main research directions in gesturally controlled realtime computer music have been the design of novel *input devices* (Paradiso 1997) and the research on new *sound synthesis algorithms* (Borin, De Poli and Sarti 1997).

New input device, also known as *gestural or musical controllers*, *control surfaces* or (*hardware*) *interfaces*, currently allow the acquisition of virtually all performer gestures and movements (Mulder 1994). Conversely, existing synthesis algorithms are capable of creating a wide range of sounds in real time using affordable hardware.

But once *gestural* or *performance variables* which result from performer movements are available in a digital form, one needs to devise methods to relate them to available *synthesis variables*: the inputs of the sound generating system. This relationship is commonly known in computer music as (*parameter*) *mapping*.

The *gestural controller*, the *synthesis algorithm* and the *mapping strategies* constitute what can be called a *digital musical instrument* (DMI). But, in the above focus on devices and on synthesis algorithms, the proposition of DMIs with simple one-to-one mappings between gestural variables and synthesis variables was the rule.

Recently, we have witnessed the emergence of a trend to broaden this scope to include considerations of the intrinsic role of different mapping strategies, including their influence on instrument design (Bowler, Purvis, Manning and Bailey 1990, Winkler 1995, Garnett and Goudeseune 1999, Hunt, Wanderley and Kirk 2000).[1]

In fact, mapping is often viewed from different perspectives: as a constituent part of a DMI or part of a composition. In both cases, gestural variables are mapped to sound synthesis variables, but in the first case, mapping strategies are determinants of *instrument expressivity* (Rovan, Wanderley, Dubnov and Depalle 1997, Favilla 1997, Hunt and Kirk 2000). In the second case they are the essence of the composition itself (Doornbusch 2001). On a higher level, effort is being made to bridge these two aspects into a view of mapping as the key to system design (Oppenheim 2001).

In this issue of *Organised Sound* we set our goal to analyse in detail the various approaches to the definition of mapping strategies in both the design of new digital musical instruments and as part of interactive music systems. Questions addressed in this issue include:

- Is mapping part of a composition, part of an instrument, or both?
- How can one devise mapping strategies for these different systems? Are there models of mapping strategies available?
- Should mapping be explicitly defined or devised using methods such as neural networks? Should it be static or dynamic? Simple or complex? Intuitive or learned?
- What is the influence of the choice of mapping strategies in the expressive capabilities of new instruments? Is it simply an aesthetic choice?

The ten original contributions in this issue focus on the role of mapping and on the design of mapping strategies:

- Four articles provide a detailed review of existing works where the definition of mapping is intrinsically analysed: Goudeseune; Hunt and Wanderley; Fels, Gadd and Mulder; and Arfib, Couturier, Kessous and Verfaille. It is interesting to notice the richness of points of view, reflecting the substantial interest in this subject.

[1]At least three Ph.D. theses have substantially dealt with mapping strategies: Hunt 1999, Goudeseune 2001 and Wanderley 2001.

- Four other articles by Myatt, Ng, Nichols, and Burtner describe the design, implementation and performance issues related to novel interactive systems and digital musical instruments where mapping was carefully devised as an essential feature.
- Doornbusch presents an interesting discussion of mapping seen as a compositional feature, where different composers discuss their approach to mapping in their own works.
- Levitin, McAdams and Adams present a conceptual framework describing musical tone production, as part of an integrated scheme for characterising musical control space. Applications of their research include the design of gesture-to-sound mappings and new instrument controllers to increase creativity and expression in computer music performance.

With this edition of *Organised Sound* we attempted to explicitly address questions related to mapping strategies in realtime computer music by presenting an in-depth survey of the existing developments in this area. Nevertheless, due to space constraints, it cannot completely define the discussion in a single issue. We therefore welcome readers to participate further in discussions about mapping at the ICMA/EMF *Working Group on Interactive Systems and Instrument Design in Music* (ISIDM).[2] Links to many of the papers referenced in the contributions that follow can be found at this site, along with texts and online discussions of topics related to parameter mapping, including its importance (Hunt, Wanderley and Paradis 2002) and limitations (Chadabe 2002).

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[2]http://www.igmusic.org/