

Review of Cipriani Alessandro, and Giri Maurizio 'Electronic Music and Sound Design: Theory and Practice with Max/MSP'

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In the age of broadening participation (to use the prevalent UK term), computer programming in university music technology programmes is taught to populations far more diverse intellectually, culturally and aesthetically than in the past. Many of us are more likely now to teach students who may have relative difficulty navigating sizeable gaps between theory and practical application or who are readily overwhelmed by overly abstract and engineering-oriented presentation of concepts.

In this context, many teachers and students alike will find great value in Alessandro Cipriani and Maurizio Giri's *Electronic Music and Sound Design, Volume 1*. First, the text sets itself apart by being designed from the outset with clear pedagogical principles. It makes an explicit structural distinction between theory and practice, and then balances and integrates them in a way that helps students directly experience how theory and practice interrelate fruitfully. In the process, the authors have crafted a book that, though written explicitly for training in Max/MSP, transcends that specificity. The approach makes it very clear to a student that Max/MSP is simply one vehicle in which the theory can be manifest, and helps students experience the dialogue between theory and practice as something natural, useful and perhaps even fun.

Each chapter clearly sets out the 'learning agenda' – helping to ensure that intended learning outcomes, rather than specific teaching processes, are the priority. The chapters integrate a variety of exercises and information sources such as listening tasks, analysis, tests, glossaries of terms, and discographies. Chapters conclude with concept summaries and short questions that review the covered territory. The book is meticulously structured, so, despite the many types of information presented, the material is easy to read and follow.

Theory chapters do not reference specific computer languages, but they do make excellent use of a downloadable program (a Max/MSP-authored standalone) from the book's website to provide interactive examples. These immediately tie the theory to concrete results and invite

aural exploration. The theories are described with great care to be clear and readily understandable, alternating appropriately between abstract concepts and concrete examples.

The practice chapters demonstrate how the preceding theory chapter translates into Max/MSP, and, as such, they essentially repeat the structure of the corresponding theory chapter. The coding is supported by a set of downloadable Max/MSP abstractions and objects that provide useful functions not available in the core Max/MSP release. The authors have adapted ideas from foreign language textbooks, designing exercises that help students to experience a sense of mastery even when they do not yet have the full ‘vocabulary’ needed to make extended algorithms from the ground up.

Finally, occasional ‘interlude’ chapters look more closely at specific Max/MSP programming topics that are not necessarily related to broader computer music theory.

Given its thoroughness and clarity, the book is well aligned with active-learning approaches that seek to steer away from using class time to deliver only theory and demonstrations. Indeed, one could potentially use the book to provide excellent theoretical and practical self-study assignments for students. Then class time can address hands-on problem-solving activities that allow the teacher to truly gauge and respond to students’ level of understanding of the material.

In our first use of the book in our own classes, we used it to help prepare students to compose algorithm-assisted and interactive pieces. Thus, we supplemented the book with assignments that required students to integrate the theory and technique with compositional tasks.

We used Chapter 1T to review theory of frequency, amplitude, timbre, waveform and envelopes. The practical examples provided in chapter 1P deal with Max/ MSP specifics for synthesising sequenced and overlapping sounds using basic waveforms and control of amplitude, frequency and panning. The chapter also introduces randomness. At this point, then, the students already had enough understanding in place for us to assign a simple etude. Chapters 2T and 2P cover the theory and practice of additive synthesis and provided the basis for lectures on harmonic and inharmonic components, waveforms, phase, and additive synthesis. After studying this, our students composed a short study based on additive synthesis. We used Chapter 3T and Chapter 3P to introduce subtractive synthesis theory. The examples of the book served to develop the ability of students to hear the basic effects caused by filters

and describe their characteristics. After concluding Chapter 3P, our students composed a short study based on these techniques. Chapter 4T and 4P introduced students to control signals, DC offset, tremolo, vibrato, pulse-width modulation and multi-channel panning. At this point, we assigned our students a full-scale composition that integrated techniques from the first four chapters in the form of a self-running algorithmic piece that executes at the push of a button.

The fact that the whole book covers the above territory, which we have typically addressed in one 12-week term, indicates its depth and detail. The authors suggest this material represents 60 hours' worth of classroom-based learning plus 120 hours of individual study. This thoroughness also explains why there will be two more volumes in the series. The English version of the second volume is scheduled for release in 2013, covering sampling, delay lines, dynamics processing and composition topics. Details about the books and additional resources are available at www.virtual-sound.com. An online forum supports discussion about the series, identification of errors and general Max/MSP questions, as does a Facebook page.

The book is apparently published via a print-on-demand system. Interestingly, this means that the authors can potentially make corrections to the book as they become aware of errors. This seems quite advantageous and exciting on the whole. What this will mean practically for teachers who are trying to ensure that they and all of their students are referring to the same version of the text remains to be seen. It will be interesting, too, to see how this impacts the authors' capacity to respond to changes in the Max/MSP versions, an ever-present problem for textbooks that address specific software. (Volume 1 is based on Max/MSP version 5 rather than version 6.)

Overall, this series promises to set a new standard for pedagogical soundness, accessibility, clarity and thoroughness in computer programming-oriented electronic music textbooks. It seems likely that the series will enable significant and deeper subject understanding for a broader range of readers, including students in a full range of university programmes.