Overview

Chapter 1 projects a view of nine time scales of musical sound structure. It examines this hierarchy from both aesthetic and technical viewpoints. Major themes of this chapter include: the boundaries between time scales, the particularities of the various time scales, and the size of sounds.

Chapter 2 traces the history of the idea of microsound, from the ancient philosophy of atomism to the recent analog era. It explains how particle models of sound emerged alongside wave-oriented models. It then presents the modern history of microsound, beginning with the Gabor matrix. It follows the writings of a diverse collection of authors, including Ezra Pound, Henry Cowell, Werner Meyer-Eppler, Iannis Xenakis, Abraham Moles, Norbert Wiener, and Karlheinz Stockhausen. It also looks at the viability of a microsonic approach in analog synthesis and instrumental music.

Chapter 3 presents the theory and practice of digital granular synthesis in its myriad manifestations. It examines the different methods for organizing the grains, and looks at the effects produced in each parameter of the technique. It then surveys the various implementations of computer-based granular synthesis, beginning with the earliest experiments in the 1970s.

Chapter 4 is a catalog of experiments with newer particles, featuring glissons, grainlets, pulsars, and trainlets. We also examine sonographic and formant particles, transient drawing, particle cloning, and physical and abstract models of particle synthesis.

Chapter 5 surveys a broad variety of microsonic sound transformations. These range from audio compression techniques to micromontage and granulations. The brief presentation on the Creatovox instrument emphasizes real-time performance with granulated sound. The chapter then covers transformations on a micro scale, including pitch-shifting, pitch-time changing, filtering, dynamics processing, frequency-domain granulation, and waveset transformations.

The final sections present techniques of spatialization with sound particles, and convolution with microsounds.

Chapter 6 explores a variety of sound transformations based on windowed spectrum analysis. After a theoretical section, it presents the main tools of windowed spectrum transformation, including the phase vocoder, the tracking phase vocoder, the wavelet transform, and Gabor analysis.

Chapter 7 turns from technology to compositional applications. It begins with a description of the first studies realized with granular synthesis on a digital computer. It then looks at particle techniques in my recent compositions, as well as those by Barry Truax, Horacio Vaggione, and other composers.

Chapter 8, on the aesthetics of composing with microsound, is the most philosophical part of the book. It highlights both specific and general aesthetic issues raised by microsound in composition.

Chapter 9 concludes with a commentary on the future of microsound in music.