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DASHAWN SILAS

Computer Models of Musical

Creativity Oxford University Press
Episodes in the transformation of our understanding of sound and space, from binaural listening in the nineteenth century to contemporary sound art. The relationship between sound and space has become central to both creative practices in music and sound art and contemporary scholarship on sound. Entire subfields have emerged in connection to the spatial aspects of sound, from spatial audio and sound installation to acoustic ecology and soundscape studies. But how did our understanding of sound become spatial? In *Stereophonica*, Gascia Ouzounian examines a series of historical episodes

that transformed ideas of sound and space, from the advent of stereo technologies in the nineteenth century to visual representations of sonic environments today. Developing a uniquely interdisciplinary perspective, Ouzounian draws on both the history of science and technology and the history of music and sound art. She investigates the binaural apparatus that allowed nineteenth-century listeners to observe sound in three dimensions; examines the development of military technologies for sound location during World War I; revisits experiments in stereo sound at Bell Telephone Laboratories in the 1930s; and considers the creation of "optimized acoustical environments" for theaters and factories. She explores the development of multichannel "spatial music" in the 1950s

and sound installation art in the 1960s; analyzes the mapping of soundscapes; and investigates contemporary approaches to sonic urbanism, sonic practices that reimagine urban environments through sound. Rich in detail but accessible and engaging, and generously illustrated with photographs, drawings, maps, and diagrams of devices and artworks, *Stereophonica* brings an acute, imaginative, and much-needed historical sensibility to the growing literature around sound and space.
The SuperCollider Book Routledge
Below the level of the musical note lies the realm of microsound, of sound particles lasting less than one-tenth of a second. Recent technological advances allow us to probe and manipulate these pinpoints of sound, dissolving the traditional building

blocks of music—notes and their intervals—into a more fluid and supple medium. The sensations of point, pulse (series of points), line (tone), and surface (texture) emerge as particle density increases. Sounds coalesce, evaporate, and mutate into other sounds. Composers have used theories of microsound in computer music since the 1950s. Distinguished practitioners include Karlheinz Stockhausen and Iannis Xenakis. Today, with the increased interest in computer and electronic music, many young composers and software synthesis developers are exploring its advantages. Covering all aspects of composition with sound particles, *Microsound* offers composition theory, historical accounts, technical overviews, acoustical experiments, descriptions of musical works, and aesthetic reflections. *Microsound* Oxford University Press, USA

With the increase of digital and networked media in everyday life, researchers have increasingly turned their gaze to the symbolic and cultural elements of technologies. From studying online game communities, locative and social media to YouTube and mobile media, ethnographic

approaches to digital and networked media have helped to elucidate the dynamic cultural and social dimensions of media practice. The Routledge Companion to Digital Ethnography provides an authoritative, up-to-date, intellectually broad, and conceptually cutting-edge guide to this emergent and diverse area. Features include: a comprehensive history of computers and digitization in anthropology; exploration of various ethnographic methods in the context of digital tools and network relations; consideration of social networking and communication technologies on a local and global scale; in-depth analyses of different interfaces in ethnography, from mobile technologies to digital archives. *Music Query* Saint Philip Street Press

Recent studies from Europe and North America concerned with the query and analysis of musical data. The field of music query has grown from tentative beginnings in bibliographical systems of earlier decades to a substantial area of interdisciplinary studies in little more than a decade. This volume assembles recent studies from Europe and North America concerned with the query and analysis of

musical data. Among these, methods for the synchronization of sound and symbolic data, for automatic analysis through perceptual rules, and for computing a transportation distance for thematic comparison are described. The modeling of rhythmic motifs, of melodic traits, and of cognitive distance are discussed. User studies report on human preferences in modes of query (humming vs. tapping, etc.) and on the comparative success rates of more than two dozen proposed metrics for melodic comparison.

Music: A Mathematical Offering MIT Press

A practitioner's guide to the basic principles of creating sound effects using easily accessed free software. *Designing Sound* teaches students and professional sound designers to understand and create sound effects starting from nothing. Its thesis is that any sound can be generated from first principles, guided by analysis and synthesis. The text takes a practitioner's perspective, exploring the basic principles of making ordinary, everyday sounds using an easily accessed free software. Readers use the Pure Data (Pd) language to construct sound objects, which are more flexible and useful than

recordings. Sound is considered as a process, rather than as data—an approach sometimes known as “procedural audio.” Procedural sound is a living sound effect that can run as computer code and be changed in real time according to unpredictable events. Applications include video games, film, animation, and media in which sound is part of an interactive process. The book takes a practical, systematic approach to the subject, teaching by example and providing background information that offers a firm theoretical context for its pragmatic stance. [Many of the examples follow a pattern, beginning with a discussion of the nature and physics of a sound, proceeding through the development of models and the implementation of examples, to the final step of producing a Pure Data program for the desired sound. Different synthesis methods are discussed, analyzed, and refined throughout.] After mastering the techniques presented in *Designing Sound*, students will be able to build their own sound objects for use in interactive applications and other projects *Spaces Speak, Are You Listening?* A&C Black

Electronic music evokes new sensations, feelings, and thoughts in both composers and listeners. Opening the door to an unlimited universe of sound, it engages spatialization as an integral aspect of composition and focuses on sound transformation as a core structural strategy. In this new domain, pitch occurs as a flowing and ephemeral substance that can be bent, modulated, or dissolved into noise. Similarly, time occurs not merely as a fixed duration subdivided by ratios, but as a plastic medium that can be generated, modulated, reversed, warped, scrambled, and granulated. Envelope and waveform undulations on all time scales interweave to generate form. The power of algorithmic methods amplify the capabilities of music technology. Taken together, these constitute game-changing possibilities. This convergence of technical and aesthetic trends prompts the need for a new text focused on the opportunities of a sound oriented, multiscale approach to composition of electronic music. Sound oriented means a practice that takes place in the presence of sound. Multiscale means an approach that takes into account the perceptual and physical

reality of multiple, interacting time scales—each of which can be composed. After more than a century of research and development, now is an appropriate moment to step back and reevaluate all that has changed under the ground of artistic practice. *Composing Electronic Music* outlines a new theory of composition based on the toolkit of electronic music techniques. The theory consists of a framework of concepts and a vocabulary of terms describing musical materials, their transformation, and their organization. Central to this discourse is the notion of narrative structure in composition—how sounds are born, interact, transform, and die. It presents a guidebook: a tour of facts, history, commentary, opinions, and pointers to interesting ideas and new possibilities to consider and explore.

Music Data Analysis MIT Press

This book discusses the applications of evolutionary computation to music and the tools needed to create and study such systems. These tools can be combined to create surrogate artificial worlds populated by interacting simulated organisms in which complex musical

experiments can be performed. The book demonstrates that evolutionary systems can be used to create and to study musical compositions and cultures in ways that have never before been achieved. *The Computer Music Tutorial* MIT Press Pendragon Press is proud to offer this new, revised, and expanded edition of Formalized Music, Iannis Xenakis's landmark book of 1971. In addition to three totally new chapters examining recent breakthroughs in music theory, two original computer programs illustrating the actual realization of newly proposed methods of composition, and an appendix of the very latest developments of stochastic synthesis as an invitation to future exploration, Xenakis offers a very critical self-examination of his theoretical propositions and artistic output of the past thirty-five years. This edition of Formalized Music is an essential tool for understanding the man and the thought processes of one of this century's most important and revolutionary musical figures.

Introduction to Computer Music Univ of California Press

"He then describes a model that integrates

these different aspects - an inductive-association computational process that can create music. Cope's writing style is lively and nontechnical; the reader needs neither knowledge of computer programming nor specialized computer hardware or software to follow the text."-- Jacket.

Sonic Interaction Design Editions L'Harmattan

This book is a comprehensive introductory presentation of the key research areas in the interdisciplinary fields of sonification and auditory display. Chapters are written by leading experts, providing a wide-ranging coverage of the central issues, and can be read from start to finish, or dipped into as required. Sonification conveys information by using non-speech sounds. To listen to data as sound and noise can be a surprising new experience with diverse applications ranging from novel interfaces for visually impaired people to data analysis problems in many scientific fields. This book gives a solid introduction to the field of auditory display, the techniques for sonification, suitable technologies for developing sonification algorithms, and the most

promising application areas. The book is accompanied by an online repository of sound examples.

The Sonification Handbook John Wiley & Sons

What might an interactive artwork look like that enabled greater expressive potential for all of the components of the event? How can we radically shift our idea of interactivity towards an ecological conception of the term, emphasising the generation of complex relation over the stability of objects and subjects?

Gathering Ecologies explores this ethical and political shift in thinking, examining the creative potential of differential relations through key concepts from the philosophies of A.N. Whitehead, Gilbert Simondon and Michel Serres. Utilising detailed examinations of work by artists such as Lygia Clark, Rafael Lozano-Hemmer, Nathaniel Stern and Joyce Hinterding, the book discusses the creative potential of movement, perception and sensation, interfacing, sound and generative algorithmic design to tune an event towards the conditions of its own ecological emergence. This work was published by Saint Philip Street Press

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Iannis Xenakis, la musique

électroacoustique MIT Press (MA)

Les oeuvres électroacoustiques de Xenakis ne comptent que pour un dixième dans sa production, mais elles sont très importantes. Composées à des moments clés de l'évolution de Xenakis, ces oeuvres peuvent s'analyser pour comprendre divers aspects de sa pensée musicale, théorique, esthétique et interdisciplinaire : recherches sur le bruit, théorie du granulaire, expérimentations en matière de spatialisation, réalisations interartistiques. (Des articles en français et en anglais).

Bug Music MIT Press

Earth Sound Earth Signal is a study of energies in aesthetics and the arts, from the birth of modern communications in the nineteenth century to the global transmissions of the present day. Grounded in the Aeolian sphere music that Henry David Thoreau heard blowing in telegraph lines and in the Aelectrosonic sounds of natural radio that Thomas

Watson heard in telephone lines, the book moves through the histories of science, media, music, and the arts to the 1960s, when the composer Alvin Lucier worked with the "natural electromagnetic sounds" present from "brainwaves to outer.

Composing Electronic Music Oxford University Press

A comprehensive text and reference that covers all aspects of computer music, including digital audio, synthesis techniques, signal processing, musical input devices, performance software, editing systems, algorithmic composition, MIDI, synthesizer architecture, system interconnection, and psychoacoustics. The Computer Music Tutorial is a comprehensive text and reference that covers all aspects of computer music, including digital audio, synthesis techniques, signal processing, musical input devices, performance software, editing systems, algorithmic composition, MIDI, synthesizer architecture, system interconnection, and psychoacoustics. A special effort has been made to impart an appreciation for the rich history behind current activities in the field. Profusely

illustrated and exhaustively referenced and cross-referenced, The Computer Music Tutorial provides a step-by-step introduction to the entire field of computer music techniques. Written for nontechnical as well as technical readers, it uses hundreds of charts, diagrams, screen images, and photographs as well as clear explanations to present basic concepts and terms. Mathematical notation and program code examples are used only when absolutely necessary. Explanations are not tied to any specific software or hardware. The material in this book was compiled and refined over a period of several years of teaching in classes at Harvard University, Oberlin Conservatory, the University of Naples, IRCAM, Les Ateliers UPIC, and in seminars and workshops in North America, Europe, and Asia.

Formalized Music MIT Press

Electronic music evokes new sensations, feelings, and thoughts in both composers and listeners. Opening the door to an unlimited universe of sound, it engages spatialization as an integral aspect of composition and focuses on sound transformation as a core structural

strategy. In this new domain, pitch occurs as a flowing and ephemeral substance that can be bent, modulated, or dissolved into noise. Similarly, time occurs not merely as a fixed duration subdivided by ratios, but as a plastic medium that can be generated, modulated, reversed, warped, scrambled, and granulated. Envelope and waveform undulations on all time scales interweave to generate form. The power of algorithmic methods amplify the capabilities of music technology. Taken together, these constitute game-changing possibilities. This convergence of technical and aesthetic trends prompts the need for a new text focused on the opportunities of a sound oriented, multiscale approach to composition of electronic music. Sound oriented means a practice that takes place in the presence of sound. Multiscale means an approach that takes into account the perceptual and physical reality of multiple, interacting time scales—each of which can be composed. After more than a century of research and development, now is an appropriate moment to step back and reevaluate all that has changed under the ground of artistic practice. *Composing Electronic*

Music outlines a new theory of composition based on the toolkit of electronic music techniques. The theory consists of a framework of concepts and a vocabulary of terms describing musical materials, their transformation, and their organization. Central to this discourse is the notion of narrative structure in composition—how sounds are born, interact, transform, and die. It presents a guidebook: a tour of facts, history, commentary, opinions, and pointers to interesting ideas and new possibilities to consider and explore.

Microsound Springer Science & Business Media

An introduction to the ideas of computer programming within the context of the visual arts that also serves as a reference and text for Processing, an open-source programming language designed for creating images, animation, and interactivity.

Cracked Media Pendragon Press

A must-have introduction that bridges the gap between music and computing. The rise in number of composer-programmers has given cause for an essential resource that addresses the gap between music

and computing and looks at the many different software packages that deal with music technology. This up-to-date book fulfills that demand and deals with both the practical use of technology in music as well as the principles behind the discipline. Aimed at musicians exploring computers and technologists engaged with music, this unique guide merges the two worlds so that both musicians and computer scientists can benefit. Defines computer music and offers a solid introduction to representing music on a computer. Examines computer music software, the musical instrument digital interface, virtual studios, file formats, and more. Shares recording tips and tricks as well as exercises at the end of each section to enhance your learning experience. Reviews sound analysis, processing, synthesis, networks, composition, and modeling. Assuming little to no prior experience in computer programming, this engaging book is an ideal starting point for discovering the beauty that can be created when technology and music unite. *The Routledge Companion to Sounding Art* MIT Press
This handbook provides a cross-section of

the most field-defining topics and debates in the field of computer music today. From music cognition to pedagogy, it situates computer music in the broad context of its creation and performance across the full range of issues that crop up in discourse in the field.

Ways of Hearing MIT Press

This collection of short expository, critical and speculative texts offers a field guide to the cultural, political, social and aesthetic impact of software. Experts from a range of disciplines each take a key topic in software and the understanding of

software, such as algorithms and logical structures.

Evolutionary Computer Music MIT Press

An inspired application of Possible World theory to approach and interpret the acoustic environment, music and sound art.